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# *Opalita*

and  
How to Grow it.

Published by  
The J. E. WING & BROS.  
SEED CO.

MECHANICSBURG, OHIO.

# INDEX

And Table of Quantities Required per Acre; Also Weight per Bushel

	Page	Sow (if alone) per Acre	Weight per bu.
Alfalfa or Lucerne	3	20 lbs.	60
Alsike or Hybrid Clover	21	8 to 12 lbs.	60
Awnless Brome Grass	24	20 to 25 lbs.	14
Beans, Ito San	28		
Beans, Soja	27	1/3 bu. drilled	60
Beans, Medium Early Yellow	28		
Beans, Medium Early Green	28		
Buckwheat	31	1 bushel	52
Barley, Champion Beardless (Sow for nurse crop, 1 1/2 to 2 bu.)	30	2 bushels	48
Barley, Bearded	30	1 1/2 to 2 1/2 bushels	48
Barley, Oederbrucker	30	1 1/2 to 2 1/2 bushels	48
Canada Blue Grass	26	40 lbs.	14
Corn	12	9 lbs.	56
Canadian Field Peas	28	1 1/2 to 3 bu. per acre	60
Clarage Corn	17		
Clovers	19	12 lbs.	60
Crimson or Scarlet Clover	22	14 to 21 lbs.	60
Cow Peas	28	1/2 to 2 bu.	60
English or Perennial Rye-Grass	25	20 to 25 lbs.	14
German or Golden Millet	27	50 lbs.	50
Grasses, Various	23	35 lbs.	14
Hungarian Millet	27	48 lbs.	48
Ito San	28		
Japanese Millet (in drills, 10 to 12 lbs.)	27	Broadcast 15 lbs.	
Kentucky Blue Grass	26	3 bushels	14
Meadow Fescue	26	55 lbs.	22
Millets	27		
Orchard Grass	25	20 to 25 lbs.	14
Oats, Swedish Select	29	2 to 3 bu.	32
Oats, American Wonder	29	2 to 3 bu.	32
Oats, Big Four	29	2 bushel	32
Oats, Improved American	30	2 bushel	32
Pearl Millet	27	10 lbs.	
Peas, Canada Field	28	1/2 to 3 bu.	60
Peas, Cow	28	1/2 to 2 bu.	60
Red Clover	19	10 to 12 lbs.	60
Red Top	25	20 to 40 lbs.	14
Reid's Yellow Dent Corn	16		
Red or Creeping Fescue	26	35 lbs.	14
Rape, True Dwarf Essex	29	3 to 5 lbs.	
Rye	30	1 1/2 bushel	56
Sheeps Fescue	26	30 lbs.	12
Sweet Clover, Melilotus	20	10 to 20 lbs.	60
Soja Beans	27	1/3 bu. drilled	60
Seed Wheat	31		
Seed Wheat, Foltz	31	1 1/2 bushel	60
Seed Wheat, Poole	31	1 1/2 bushel	60
Seed Wheat, Gypsy	31	1 1/2 bushel	60
Tall Meadow Oat Grass	25	40 to 50 lbs.	10
Tall Meadow Fescue	26	35 lbs.	14
Timothy	26	15 to 20 lbs.	45
Vetches	29		
Vetch, Winter	29	40 to 60 lbs.	60
Vetch, Spring	29	50 to 75 lbs.	60
White Clover	21	9 lbs.	60
Wing's Imp. White Cap Corn	14	9 lbs.	56
Wing's 120 day White Corn	15	9 lbs.	56
Wing's 100 day White Corn	16	9 lbs.	56
Wing's 120 day Yellow Corn	17	9 lbs.	56



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## INTRODUCTION

There are occasions when self-congratulations are in order with any of us. The farmer is justly proud of his large crops, the more so when he realizes that their size is due to his own skill and industry in producing them. The business man has as much reason to congratulate himself over a business success, and especially so if it is owing to the quality of goods which he has sold, rather than to his skill in advertising; and we really believe that we have reason to be proud of the business which we have established, especially since it has been built up in a very few years' time, and with very little expense for advertising as compared with that of other firms.

We have been selling seed for quite a few years, beginning entirely as an accommodation to a few of our friends who wanted the best, and who trusted our ability to secure them. For a number of years we did not advertise at all, but finally found that we could not afford to give our time to business that was not at least moderately remunerative, and that we needed to advertise in order to make it profitable in any degree; so, three years ago, we began advertising in a very small way. For several years we either doubled or trebled the previous year's business in each successive year, until the business reached moderate proportions. Last year, we did not double the previous year, but we did increase it considerable, and considering all conditions, we think that this was a good record.

When we began the business, it seemed to us from observing other seedsmen that the profits must be very large; in fact, that with any kind of skill at all, one could net 15 or 20 per cent on his investment. We have been content, however, to handle the business on as small a margin as is safe to conduct a business; in fact, our friends tell us that it is entirely too small to be safe. Frankly, last year we made a net profit of 6 per cent on the money invested in these seeds. We are continuing this policy, however, because we tell our skeptical friends that as our reputation becomes established, as we secure more customers and trade, the proportion of expenses to gross receipts will certainly lessen, leaving our profits somewhat larger. We may be in error about this, but the principle looks sound to us; in fact, it looks to us as if with twice the business which we now handle, our expenses would increase only a small amount, and we would be able to give our customers even lower prices than we are now doing, and still make what profit we cared to.

On one point, however, we hope our customers will not be deceived. We are trying to handle just one grade of seed, *the best* obtainable. With some of the seed which we handle, or instance, timothy and clover, our best stocks are of an export grade which is handled by very, very few other seedsmen, and our prices on this will look pretty high. We feel repaid for our trouble in securing this quality, when our customers write us that these seeds are the best that they have ever seen.

We have always thought that we were IT in the Alfalfa Seed business, and now we know it. The most particular class of buyers in the United States, we believe, are the Experiment Stations and Agricultural Colleges. Last year, we sold to no fewer than a dozen of these, and to their directors for their own private use. In fact, only one of those that inquired of us during the year, escaped us; furthermore, out of about two thousand Alfalfa customers to whom we sold last year, we think we had two complaints, and they were very mild.

This year we have tried harder than ever to secure the best seeds in everything which we will offer. We have the finest Beardless Barley that we ever saw; Alfalfa Seed which we cheerfully guarantee 99 per cent pure, and free from dodder and adulteration; Clover Seed which we guarantee in like manner; Seed Oats which look to us to be as perfect as are obtainable; Grass Seed which has been tested by the Government and found O. K. Our Seed-Corn house is chuck full of the finest type of corn. On other pages we give photographs of some of this seed corn. We are as proud of our stocks as a hen of her one chicken, and it was only by using force that the photographer induced us not to photograph the entire lot, and persuaded us to make selections instead. The entire lot is so nearly like the sample which we show, that we still believe that we would have been all right to photograph all of it without making any selections.

Our Wing's White Cap Corn this year made a remarkable improvement over last year. We were surprised ourselves to find what excellent quality we had; and in our new steam-heated corn room, it has dried out in magnificent shape, in fact, being almost too dry to handle easily without undue shelling.

We trust that your dealings with us in the past have been so satisfactory that we may expect a continuance of your patronage. We assure you that your orders will be appreciated, and that they will receive the same prompt and careful attention in the future as they have in the past.

## GUARANTEE

While our seeds are selected with the greatest care we do not guarantee them except where it is definitely so stated. However, we are perfectly willing that our customers should send our samples for analysis either to the Department of Agriculture at Washington or to your state experiment station, and we will also be glad to have them tested for germination.

## PRICES

Prices of many of the grass seeds fluctuate so much in market that we have decided, instead of putting our prices in the catalogue at a high enough level so that we could be sure to maintain it throughout the season, to use the Price List, which is independent of the catalogue, and this will be found enclosed. We will change our prices as market conditions compel us to, thereby giving our customers the benefit of any fall in prices, instead of beginning the season on a high level and maintaining it throughout as some other seedmen do.

In order to take advantage of our Price Lists, orders should be sent us immediately upon receipt of them. It is probable that many of the grass seeds will fluctuate enough this year so that we will have to change our prices about once a week.

## SHIPMENTS

Unless otherwise requested, we make all shipments the day following receipt of order. When requested, we will hold shipment a reasonable time, until customers are ready to have us make shipment.

## IMPORTANT SUGGESTIONS

When ordering seeds of us be sure to specify whether you wish shipment made by freight or express. We have the Big Four railroad and the American Express only.

Be sure also to state your county and railroad, as this facilitates your shipment.

We sell absolutely for cash. We accept checks at their face value, drafts or money orders, but if cash in some form does not accompany your order it is our invariable rule to send either C. O. D., or if by freight to attach sight draft to the bill-of-lading, payable upon arrival of the seed and after your inspection. This method of shipping whereby we attach sight draft to the bill-of-lading is very safe for our customers themselves, as they do not have to pay the draft until the goods arrive, nor do they have to pay at all unless the goods are satisfactory.

## AN EXPLANATION

Knowing the people who write to us about alfalfa and seeds to be among the progressive and wide-awake farmers and land owners of the country, it occurs to us that they might be interested in a subject that is becoming of greater importance each year—the growing of timber.

The constantly increasing price of fence posts and all kinds of lumber used on the farm makes the subject one of vital importance. One of our neighbors, Mr. H. C. Rogers, seems to be solving the question in a practical and business-like way. A letter written him addressed Mechanicsburg, Ohio, Box B, will bring you full information and prices.

Signed,

THE J. E. WING & BROS. SEED CO.

## SHORT HORN CATTLE

The Pines Herd was founded in 1853 from animals imported by the Madison County Importing Co. It has been owned and controlled since by a man who loves short horn cattle and who enjoys a natural genius for properly mating them, as well as the courage to rigidly cull.

Those who liked the old-fashioned short horn cow and wish such animals at reasonable prices—we can cheerfully refer to Mr. W. H. Guy, R. F. D. No. 3, Mechanicsburg, Ohio.

# ALFALFA or LUCERNE

Easily the "Queen" of all the clovers, and of all the plants of the meadow, is alfalfa. It is the hardest of them all, the most lasting, the most productive, the most efficient soil enricher. It is the most beautiful, and it yields hay of the highest quality.

Alfalfa is not new to the United States, but only within recent years has its culture been well understood, and a few essentials of its success been learned. It revels in dry land made sweet with lime (where this is needed), and rich with manures. Alfalfa is the most energetic soil enricher of all the clovers, but it must find fertile soil on which to begin, and cannot, like sweet clover, begin on wornout lands. Once it is well established, however, its ability to build up the field on which it stands, and the adjoining fields (from the manure made by feeding the hay), is nothing less than marvelous.

The New Jersey experiment station has shown that the yield of an acre of good alfalfa contained fertilizing ingredients that would cost on the market in the shape of commercial fertilizers at least \$65.00. So it can readily be seen that once alfalfa is established on a farm, and the hay fed thereon and the manure saved, that farm must very rapidly increase in productiveness.

Alfalfa is a perennial, enduring on well drained soils from five to fifty years with one sowing. It may be cut from three to five times a year, and will yield, in the regions of the corn-belt, from three to eight tons of hay per acre. The composition of alfalfa hay is such that it is of almost the same nutritive value as wheat bran, and may be substituted for wheat bran in the ration of clover with good results. As a feed for all classes of live stock it is unexcelled. Every animal upon the farm loves alfalfa, and thrives upon it. As a pasture plant it has no equal in the amount of gain upon animals that may be made from an acre of it, as much as 600 pounds of pork per acre being frequently reported where hogs have grazed it. It is also the best horse pasture known, and is sometimes used as a pasture for sheep and cows, although one must observe due care in de-pasturing it with these animals since they may bloat.

As a soiling crop alfalfa easily heads the list. It yields the most herbage and of the highest quality, and indeed, it is much better for the meadow, and usually for the animals, to feed it off by soiling rather than by de-pasturing.



*Mowing Alfalfa on Woodland Farm.*

### ALFALFA SEEDING

Much needless mystery has been made of the Alfalfa seeding question. So much mystery, in fact, that many farmers are afraid to try it at all. Jones recommends one method and Smith another, and how is the farmer to tell which is right? We began the study of the Alfalfa question twenty-five years ago, and since that time we have carefully watched fields of it in almost every state in the Union. We have corresponded with thousands of successful growers, and with thousands of other growers who were having troubles, and we really believe now that we are able to furnish reliable data as to just what is necessary to do in order to succeed with this plant.

We could almost sum the matter up in four words: Lime, drainage, humus, and inoculation. Perhaps we have given these in the order of their relative importance. Lime is necessary on soils not naturally of limestone formation or filled with limestone pebbles. The importance of this is impressed upon us more and more each year; in fact, we believe today, that there have been more failures throughout the United States on account of insufficient lime in the soil than from any other cause. In order to make it easy for our customers, so easy that they cannot help succeeding, we give later on full instructions for the use of lime and a list of firms from whom the lime may be purchased.

Then, as to drainage: there is no use in planting Alfalfa on any soil where water may ordinarily be found at a depth of less than three feet. The Alfalfa may grow all right until its roots strike this water, but then it will probably die.

Fertile soils contain enough humus. Impoverished soils may be so deficient that special preparation must be made before Alfalfa can possibly succeed. Stable manure where obtainable is the very best thing for adding the proper humus to the soil; and we would urge its liberal use wherever possible. It might be best to use this a year in advance of sowing Alfalfa, and follow with clean cultivation to overcome what weeds might be sown with the manure, or a good way is to top-dress the Alfalfa during its first winter, using a manure spreader and applying the manure evenly without large chunks that might smother the young plants. On impoverished soils, we would recommend preparation for Alfalfa one or two years in advance, growing such crops as Crimson Clover, Mammoth Clover, Sweet Clover, Cow Peas or Soja Beans, and preferably turning them under or else pasturing them off, so as to give the soil the greatest benefit possible from them.

We recommend inoculation, not that it is always necessary, but it is an inexpensive process, and in five cases out of six it will actually pay. This subject is fully discussed later on.

Having determined that our soil is sweet, well drained, and sufficiently supplied with humus, the only questions that remain are: the preparation of a good seed-bed, sowing at the proper time of year, and the use of good seed. For the seed-bed, it is essential that the ground be carefully fitted. It must be plowed, unless it is old ground such as corn stubble, which may be thoroughly disked instead of plowing. It is better to firm the sub-soil a little, so that only the surface is really loose. This, because if the entire soil is very loose, the seed may be planted too deep, and also because the Alfalfa seems to prefer the sub-surface being a trifle firmed.

### TIME OF SEEDING

On Woodland Farm, for many years it has been our custom to sow Alfalfa at oat-seeding time about the first week in April, using Beardless Spring Barley as a nurse crop. The Barley is usually cut for hay the last of June, and after this we sometimes secure a good cutting of Alfalfa hay the first season, although we do not count on this, and are not disappointed if we do not obtain it. We sow about one and one-half bushels barley to the acre and eighteen to twenty pounds of Alfalfa seed at the same time, usually using a disk drill and throwing the Alfalfa seed in front of the drill, unless the ground is very loose, in which case we throw the seed farther back to prevent its being covered too deeply. The Alfalfa seed should be covered about an inch. The advantages of this system are that the rains usually come about the right time for the young Alfalfa, which makes a strong growth throughout the entire season, generally giving us with the barley enough hay the first year to pay the expenses of planting, and goes into winter in vigorous shape with about ten inches or a foot of stalk standing, enough to hold the snow throughout the winter and induce a fine vigorous start in the spring. We find barley to be the best nurse crop obtainable. It takes the place of the weeds that would otherwise come, gives us some very excellent feed, and with us, does the Alfalfa good and no injury. Oats are not so good, because they shade the ground more and are much more inclined to lodge. We find that the barley hay with the small amount of Alfalfa we obtain with it, makes a forage second only to the pure Alfalfa itself. We cut this when the barley is in the milk or dough stage. It is

not always necessary, to cut the barley for hay, as it ripens its grain about July 12th in this latitude, and it is rarely that Alfalfa is suffering much by that time. Many of our neighbors cut their barley for grain, and still secure admirable stands of Alfalfa. Where no nurse crop is used, it is seldom safe to plant to Alfalfa before the 20th of June, because the weeds will almost certainly choke the young plants, and no amount of mowing will prevent their doing so.

Many of our customers prefer seeding during the summer months, and this is certainly a very excellent way, frequently succeeding as well as our own, although sometimes failing on account of summer drought preventing the young plants from obtaining sufficient growth to go through their first winter. Many farmers become prejudiced against the early spring seeding, owing to their using oats as a nurse crop, but if they would use the Beardless Barley, they would doubtless be well pleased with the earlier sowing.

For summer seeding we recommend as a good method having the Alfalfa follow a crop of early potatoes, or it may be possible to plow wheat stubble early enough to secure a stand before winter. An excellent way is to plow the ground early in the spring, harrow it as frequently as the weeds appear, and sow the Alfalfa during July. If the rains come right, such Alfalfa should make excellent growth before winter and be certain to succeed. We really believe that where Beardless Spring Barley may be used as a nurse crop, the early spring seeding is advisable in the states of Ohio, Indiana, Illinois, Michigan, and much of Pennsylvania. The late seeding is certainly preferable in some of the New England states, in Virginia, and the states south of the Ohio River. The reason for the late seeding in these states is that their climate seems to be such that the Alfalfa thrives better when sown late than when sown early, and also in part of these places quack or crab grass and other weeds will give so much trouble that the early seeding is almost sure to fail on account of them. The farther south one goes, the later is it safe to seed Alfalfa. We have many customers in Georgia, Alabama, Mississippi, Louisiana and Texas, who seed as late as November 1st, but their winters are so mild that the Alfalfa never winter-kills, and it comes on the next spring in just as good shape as if it had been sown earlier in the season.

#### FERTILIZERS

On Woodland Farm, we have found that it pays very well indeed to apply phosphate at the time of seeding, and we do this every year. Either the acid rock or bone meal may be used with excellent results, and we would recommend our customers to follow this method. No other fertilizer we have used, unless it be good barn-yard manure, seems to stimulate the Alfalfa as much as the phosphate, and even on land that has been heavily manured for many years, the additional use of phosphate makes an improvement that can be very distinctly seen; indeed, one can easily see right to the foot where the phosphate has been used.

Soils that need lime are generally benefited by basic slag. This is an expensive fertilizer that combines lime and phosphorus. Probably for the results obtained, it is not so expensive as it looks.



*Alfalfa on Woodland Farm.*

### SEED

Good seed is of great importance. We have studied Alfalfa for so many years that we pride ourselves very much upon our ability to choose the very best seed. Alfalfa seed coming from Arizona, South America, or Arabia, will grow all right the first year, and then will probably winter-kill the first winter, especially in any of the Northern states. We find that the very best seed in the world, that which is freest from dangerous weeds and which possesses the greatest vitality, is produced in our own United States, particularly in the northwestern part. Also it is better if grown on non-irrigated soil. All of our seed comes from these Northwestern states, is non-irrigated, and we cheerfully guarantee it free from Alfalfa's most deadly enemy, the dodder. When you receive seed from us, send sample to your Experiment Station, and if they detect any dodder in it, return the seed immediately, and either get your money back or more seed. If they find any trefoil, you may do the same thing. Trefoil is a harmless little clover, but it is added to the Alfalfa as an adulterant, owing to the seed being inexpensive and difficult to distinguish from the Alfalfa seed itself. We feel that we have just cause for being proud of our Alfalfa seed, for last year we sold to no fewer than one dozen of the Experiment Stations and Agricultural Colleges, and to their directors for their own private use, and no class of buyers are so particular as these.

In some of the far Southern states, an enemy constantly to be fought is the Johnson Grass. In some of these states Alfalfa seed is produced, and is very likely to be mixed with this pest.

We guarantee our seed absolutely free from this Johnson grass, and growers in any country who are troubled by it, may with perfect confidence purchase our seed.

### ALFALFA FOR THE POULTRYMAN

The poultry man will find great profit from having a run of alfalfa. This should not be too small a space, but large enough so that the poultry can forage at will without injuring the plants, and so that he may cut the hay regularly and save it for winter feeding. Poultry thrive exceedingly upon a diet composed chiefly of alfalfa, with some grain in addition.

### ALFALFA FOR THE DAIRYMAN

No other food forms so good a basis for the ration of a dairy cow as alfalfa, the reason being its extreme richness in protein, and its easy digestibility, and the additional reason that the cows love it so, and eat it so greedily. Alfalfa growing countries have a great advantage over other countries in the dairy business, so that it is well for the dairyman, wherever he is situated, to begin to consider how he may make his own soil an alfalfa-growing soil. It has been found that the cost of milk production can be cut square in two by the use of home-grown Alfalfa. A ton of Alfalfa hay, early cut and nicely cured, is worth as much pound for pound as the best wheat bran for food for the dairy cow. In order to get its full feeding value, it should be ground. Even ordinary Alfalfa hay is worth nearly as much as wheat bran; so that it is clear that to the eastern dairyman, who must pay \$25.00 a ton for wheat bran, a field of Alfalfa yielding no more than three or four tons per acre is a veritable gold mine. Governor Hoard has found that with Alfalfa in the dairy ration, it is necessary to use only about half the amount of grain that must be fed when other forage is provided. In truth, with Alfalfa hay and corn silage, little or no other food is needed to keep the dairy cow in the most profitable producing condition. We thus emphasize the importance of Alfalfa to the dairyman, because among the many thousands of Eastern dairymen, the margin between cost of production and selling price of their products is so small, that they are in a rather discouraging condition, and this condition Alfalfa will relieve better and easier than any other thing. There was a time, only a few years ago, when it would have seemed not worth while thus to attempt to raise the hopes of the dairyman, for then it had not been demonstrated that Alfalfa could be grown away from the "Alfalfa Belt." But since then we have learned the few and simple requirements of the Alfalfa plant, and now we do not hesitate to affirm that we can grow Alfalfa anywhere, upon any farm in the United States, not at too high an altitude, if the few simple but essential conditions are complied with.

### TIME TO CUT ALFALFA

We usually cut it when about one-fifth of the plants begin to show bloom. A somewhat better way of ascertaining the proper time is to watch for the buds at the base of the plants and cut when they appear above the ground. These buds are the beginnings of new stalks, and their appearance indicates that the plant is ready to make another crop.

### ALFALFA AS A PASTURE CROP

It is especially adapted to being de-pasturized by horses and hogs, and perhaps the greatest profit comes from such use. The practical difficulty with de-pasturizing alfalfa with sheep and cows is, that being a clover, it sometimes causes bloat, similar to clover bloat. The best preventive of bloat is to have the alfalfa mixed with grasses in the pasture. When this is done, the animals eating the two together are very much less apt to bloat. The best grass to mix with alfalfa for pasture is brome grass (*Bromus inermis*).

In pasturing Alfalfa, to get the best results, one should not turn on it before the plants have grown nearly to the blossoming stage; furthermore, the pasture should be so large that the animals will not eat it down closely. It should be mown at least twice during the season and made into hay. It will not do, however, to pasture the field with sheep or cattle immediately after it has been mown, this being the surest known method of inviting disaster. After Alfalfa is mown, it is not safe to turn on it until the plants have reached the woody stage. Thus treated, Alfalfa pastures will last for years, and afford an astonishing amount of nourishment.

All stock should be taken off of Alfalfa pastures by the first of October, or in the Eastern states, at the beginning of hard frosts; this, both for the good of the Alfalfa and for the good of the animals themselves. It is dangerous to de-pasturize frozen Alfalfa, and it is not even wise to cut it for hay. A profitable scheme sometimes practiced is to break an old Blue Grass pasture, plow it rather deep, fertilize it well, and seed it down to Alfalfa. A good stand of Alfalfa is almost assured by this method, and while the blue grass comes up immediately and fills in between the Alfalfa plants, within a few years, the amount of combined herbage yielded by this practice is almost incredibly great, the grass itself yielding more than it did before the Alfalfa was sown upon it. Alfalfa thus sown will not last as long as when the grass is absent, but while it is there it is extremely profitable.

In any of the states east of the Missouri, we think that farmers who pasture Alfalfa with cattle and sheep may be reasonably sure to have some losses, no matter how careful they are. We have never succeeded in pasturing it ourselves without some losses, but we believe that it is sometimes more profitable to pasture Alfalfa and lose a few sheep or perhaps a steer, than it is to handle our stock on other feed without this loss.

### ALFALFA TURNING YELLOW

This may be caused either by a leaf spot or rust, or it may indicate that conditions are not right with the plant, that it needs lime, drainage or inoculation. Mowing will usually check the rust; the other troubles are fully discussed later on.



*Alfalfa on Woodland Farm, owned by J. E. Wing & Bros. About two tons per acre this cutting, worth at least \$10.00 per ton.*

## INOCULATION

All legumes have tiny bacteria that work on their roots, forming "nodules." These bacteria draw nitrogen from the air, and both supply the plants with it and also add it directly to the soil. Without these bacteria the legumes will soon perish, although most of the legumes seem to find their proper bacteria in almost any soil. Alfalfa is an exception, and it nearly always pays to supply its bacteria artificially. This may be done very inexpensively. Obtain soil from some near-by Alfalfa field and apply it at the rate of one hundred pounds per acre, sowing it late in the afternoon and harrowing it in immediately before allowing the sun to strike it. This is the best way to inoculate. Soil from around the Sweet Clover or Melilotus roots answers equally well. The Government will furnish inoculation of another sort free; this usually succeeds, but not always. Another excellent way is to sow a few pounds of Alfalfa seed with your Red Clover. After the clover is plowed up, sow to Alfalfa, and you will probably have the field inoculated.

We have many requests for soil from our own Alfalfa fields, but we are forced to refuse to sell this.

## LIME IN THE SOIL

Alfalfa thrives best on soils that are most abundantly supplied with lime. It absolutely fails where lime is deficient. Nothing will take the place of lime, and we believe that there have been more failures throughout the Eastern States owing to this deficiency than from any other cause.

## KINDS OF LIME

Ground limestone is now manufactured in many places in the United States, and sold usually, where made, for about \$1.25 per ton. The finer it is ground, the more quickly it is available. It should be applied at the rate of about one hundred pounds per square rod, which is at the rate of eight tons per acre; although where it is inaccessible, and therefore costly, much lighter applications are used with good results, although not so lasting. Sometimes one may get crushed limestone screenings; much of it as fine as sand. This stuff is used for concrete work, walks and ballast, and often may be bought as low as 50 cents per ton or less. When the ground limestone is not available, and this coarser material is, we advise its use. Put on more of it, and eventually every bit of it will become available. It will last for many years in the soil, giving out its beneficial influence constantly. Many farmers having ledges of limestone upon their land can well afford to grind their own limestone at home; and a machine capable of grinding a little more than a ton an hour and taking in stones 11 x 13 inches in size costs about \$600.00. These machines are very durable and the expense of operating them quite light. Various firms manufacture this machinery. To save correspondence, we will mention the Jeffrey Manufacturing Co. of Columbus, Ohio, who make suitable grinders for farm use.

## METHOD OF SPREADING GROUND LIMESTONE

The distribution of the ground limestone is not very slow or difficult. On Woodland Farm, a carload containing thirty-seven and one-half tons was hauled more than a mile and spread, in two days, by using three teams, one attached to the drill and two to haul. With three teams hauling, it might have been spread in a shorter time. The drill used on this occasion was the Empire Broadcast Lime and Fertilizer Sower, manufactured by the American Seeding Machine Co. (Incorporated), Richmond, Ind. This is a very strongly made and efficient machine, though it does not sow ground limestone heavily enough, unless one goes over the land twice. Other machines are on the market, although we have not yet found one that we thought better. The lime is simply spread over the top of the ground at any time when one has leisure to do so, and by subsequent cultivation mixed with the top soil. It is very much better if the lime may be put on some weeks or months before the Alfalfa is sown. The beauty of using ground limestone is, that one may use six, eight, ten or even one hundred tons to the acre if he chooses, with absolutely no injury to the soil, and the more he puts on, the longer its influence will be felt.

## OTHER FORMS OF LIME

When limestone rock is burned, the carbon is driven off, and caustic lime remains. Burned lime has lost about one-half its weight, so that a ton of burned lime has as much power to sweeten soils as two tons of unburned or carbonate of lime. The one difficulty with burned lime is that it has this caustic nature, and is said to destroy part of the humus of the soil. Burned lime, is more easily secured, and the freight rates on it are often less than with the ground limestone. From one to two tons per acre of the caustic lime are used. It may be ground very easily after being burned, and then drilled into the soil; or it may be slaked with a little water so that it falls into a white powder, and then distributed. "Agricultural lime," often sold at absurdly high prices, is simply burned lime slaked and ground, and is in no way any better than the lump lime that any farmer can slake at home.

### AIR SLAKED LIME

Air-slaked lime will accomplish a little less in sweetening the soil than the caustic lime, but it is very much safer to apply. It will probably attack the humus of the soil somewhat, as the caustic lime does, but to a smaller extent. It is unsafe to apply either the caustic lime or the air-slaked lime at the time of sowing the alfalfa. Several of our customers have advised us that they entirely ruined their stand by this course, so we would advise applying this lime some months before attempting to seed the Alfalfa. It is advisable to use air-slaked lime at the rate of two to four tons per acre. It is unwise to sow lime and phosphate rock at the same time, as the lime will neutralize the phosphate.

### LIME NOT EVERYWHERE NEEDED

Because of the wide-spread interest in Alfalfa and lime, we get letters asking about the application of lime, from regions where we cannot think lime is needed. Hardly anywhere is it needed in the arid region, in the Dakotas, in Nebraska, perhaps nowhere in alkaline soils; probably not in any place where limestone gravel is mixed through the soil by the glaciers, would additional lime be especially needed. When it is somewhat difficult to get stands of red clover; when "sorrel" comes in the land, and crab grass crowds out the Alfalfa, when the Alfalfa plants have a sickly yellow appearance instead of a dark, vigorous green; then one may safely assume that lime is needed; and in the humid regions of the East, wherever Kentucky blue grass and white clover is not the natural carpet of the soil, alfalfa growers should take heed of the need of more carbonate of lime before sowing their seed.

### ALFALFA AND TILE UNDER-DRAINS

The question is often asked: "Will alfalfa stop tile under-drains?" On Woodland Farm with probably eighteen miles of tile under-drains, only a few hundred yards have given trouble from being stopped with alfalfa roots. These places where trouble has occurred are where running water flows through the tile continuously from perennial springs. In no instance has the alfalfa given trouble to the ordinary farm drains where the tiles become dry in summer.

### A THIN STAND OF ALFALFA

It rarely pays to try to thicken Alfalfa. The seed will usually come up all right, but for some reason it will mostly perish throughout the first season. Disking will make the Alfalfa stool out more and thereby help the stand, or Clover may be sown with the thin Alfalfa with good results.

Another very excellent method which we recommend is plowing the Alfalfa up, and plowing it quite deeply. This will not kill nearly all of the young plants. Then immediately re-seed, and the second time you will be almost certain to secure an excellent stand of Alfalfa.



*Alfalfa on Woodland Farm. Over two tons per acre this cutting.*

## WEEDS IN ALFALFA

Good soils are sure to be well stored with weed seeds; yet a thorough cultivation of the ground the year preceding the sowing of Alfalfa will accomplish much. Ordinary weed seeds are pretty well destroyed by the mower running over the ground two or three times the first season. Canada thistles are said to be eradicated by the growing of Alfalfa, and many other serious pests including *Convolvulus Arvensis*, variously styled Bindweed, Wild Morning Glory or Wild Pea Vine.

Sometimes a little Sweet Clover (*Melilotus*) is unavoidably present in Alfalfa seed. This need give no concern, since the natural mowings given the Alfalfa will eradicate it in two years. There are weeds, however, that will get the better of Alfalfa, and that right speedily. One of the worst is dodder. Not many farmers know dodder when they see it. It is a parasitic vine having an almost leafless yellow stem as large as a small twine string, which runs through the Alfalfa, twining around and around the stems, sending little rootlets in to suck the juice of the plant. Dodder begins its life from a seed dropped to the earth when the Alfalfa is sown; but after having had a brief experience with its roots in the soil, it leaves the earth and roots only in the growing Alfalfa, which it binds together in a death grip, making a dense tangle of yellow vines and slowly dying Alfalfa plants.

Farmers cannot afford to treat dodder as they would any other weed. It is so deadly that it must be stamped out immediately, or it will become a very serious pest, and the methods used to exterminate other weeds will not answer for this one. If there are only occasional small patches to be found, mow the Alfalfa in these patches before the dodder begins to bloom; then, in a few days, scatter straw over the infested areas, and burn it. This may kill the Alfalfa plants, but it will probably kill the dodder also. If your field is badly infested, there is nothing to do but to plow it up, and plant it to corn or some cultivated crop for one or two years.

Dodder infests clover just as frequently as it does Alfalfa, and it is just as dangerous in the clover as it is in the Alfalfa. Farmers should take great pains to prevent this pest from becoming established in their land, and should send samples of their seed to their Experiment Stations for analysis before seeding.

**Our own Alfalfa seed and also our Clover seed are guaranteed free from this pest. If your Experiment Station finds any dodder in our seed, we will gladly take back the seed and return your money.**

## ALFALFA IN CORN

We cannot recommend seeding Alfalfa in corn at the last cultivation, as many wish to do, because the corn nearly always shades the Alfalfa so much that it will not thrive until after the corn is cut; also the corn takes practically all of the moisture from the soil, causing the Alfalfa to suffer from drought; and it usually happens that we have most of the dry weather of the summer between the time of the last cultivation of corn and fall, so that all three of these causes will operate against the Alfalfa. We have seen many splendid successes from this method, and many failures. We think the chances of success by this method to be about equal to the chances of failure.

## MAKING ALFALFA HAY

Alfalfa hay may be cured in the same manner as Red Clover, with this difference, that as the leaves of Alfalfa when dry are extremely brittle, care must be taken to prevent their loss. This simply necessitates raking the hay when still quite tough, and it should also be shocked before it is bone dry. Alfalfa hay will cure admirably if raked quite green, shocked immediately, and allowed to stand in the shock for several days. If this method is used there will be very little loss from storms, and the hay will be of the finest possible quality. Hay caps may be used, if desired, with excellent results. When the hay is cured in the shock, open up the shocks to the sun and air for an hour or so before putting the hay into the barn. Alfalfa hay will stand more punishment from storms than any other hay that we know of. It will also keep excellently in the stack, although we think it a little more difficult to stack than Timothy hay. It may be put in the stack or mow with a trifle more sap than any other kind of hay. A safe method of ascertaining whether it is sufficiently cured to go into the stack or barn is to twist the stalks, and if no water appears the hay is in safe condition to go into the barn.

Alfalfa hay may heat somewhat and become discolored, but even then stock will relish it fully as much as if it retained its perfect green color. In stacking we find a hay derrick of great benefit, and also the use of the Myer or Stockton fork with these hay derricks. With this combination and six or eight hay sleds, we have built a thirty-ton stack in about five hours. At the barn we unload with two double harpoon forks and a hay sling in the bottom of the load. Where the hay is extremely dry, we sometimes substitute the Stockton fork for the harpoon. By this method we usually unload a two or three thousand pound load of Alfalfa hay with three or four hitches of the forks, and we have handled about fifty tons in about ten hours.

## A SPLENDID SUCCESS UNDER DIFFICULTIES

It is always inspiring to us to watch other men do things in a large way, and do them skillfully. It has given us more encouragement than we have derived from any other experience this year to observe the work of one of our customers, Mr. J. F. Jack. Mr. Jack is the kind of man who succeeds in everything that he undertakes, as inevitably as Fate itself. This is owing to three things: He has large means, and is glad to use any necessary amount of money to accomplish his ends. He has a great amount of good hard common sense and shrewdness, and in anything that he attempts he makes it a rule to secure as much expert advice as possible, and to spare neither time, trouble nor expense in doing this. Mr. Jack's home is in California. He is familiar with Eastern conditions, and, some years ago, it occurred to him that there could be large profits made from building up some of the worn-out Eastern lands, where labor was cheap, the land itself for sale at low prices, and great markets near at hand where unlimited amounts of produce could be sold. After mature deliberation, he purchased a tract of fifteen hundred acres on the tide-water in Old Virginia, some miles from Fredericksburg. The land was practically exhausted, but low-priced. Labor was plentiful and cheap. He secured ocean shipping, and he had the great Eastern markets close at hand. He had, of course, watched the enormous crops of Alfalfa in the West, and he had read of many successes with the plant in the East; part of these, we are happy to say, had been brought to his notice through our own writings. He was confident that if Alfalfa could be grown in Virginia, plenty of money could be made out of it. He consulted the highest authorities which he could find, making a personal trip to Washington for that purpose. The gentleman to whom he applied for information, when asked if Alfalfa could be made to grow in Virginia, assured him that it could, and gave him the most approved methods as adapted to Virginia conditions. But when Mr. Jack casually remarked that he thought it a good thing, and that he intended to sow one hundred and fifty acres, the Washington experts were considerably taken back. "Why, Mr. Jack!" they exclaimed, "Your failure will be so colossal that you will put the cause of Alfalfa growing in the state of Virginia back, at least twenty years! The farmers will all know of your failure, and none will dare to attempt it." "But I have no intention of failing, and you yourselves have said that it was practical to grow it in Virginia." "Yes, but think of how much you must do on this large acreage. You must lime, you must inoculate, and you must add humus to the soil." "I am thinking of it, and where is the best place for me to get the lime and inoculation?"

When these gentlemen found that Mr. Jack was thoroughly in earnest, that he meant to go ahead with his scheme in his own way and on his own scale, they gladly assisted him to the best of their ability. He purchased about four hundred tons of lime, which he applied to one hundred and fifty acres. He sowed Crimson Clover, and turned this under to add humus. He procured the best seed obtainable, and sowed about thirty pounds per acre, at the same time applying a good-sized amount of bone meal. He wrote us a few months ago that the entire one hundred and fifty acres was a most satisfactory stand, and doing as well as could be asked for, with the exception of a few strips which he had left for experiment. On some of these strips, no lime was sown, and on others, no bone. Those where no lime was sown, failed absolutely. Those where lime was sown, but no bone, were not nearly so good as the rest of his field. This year he successfully sowed one hundred and fifty acres more, and before very many years, he expects to have the entire fifteen hundred acres growing Alfalfa.

As an illustration of Mr. Jack's "sand," we would like to speak of another of his experiences. A weed native to this section appeared in his Alfalfa field this spring. He had two hundred tons of hay ready to cut; hay that should sell for \$20.00 a ton when cured. But he was determined to get rid of this weed, and from the best advice which he could gather, the only certain way of eradicating it was so severe, that he decided to destroy the weed even at the expense of his entire hay crop. So the meadows were mown, the hay immediately hauled to waste ground, and there dumped out to spoil. Had he allowed the hay to ripen so as to be really ready to cut, or had he attempted to cure it even when he did cut it, the probabilities are that many of these weed seeds would have matured, and have gone back into the soil; as it is, he thinks that he is rid of the weed forever, at an expense of \$4,000.00 worth of hay. However, it would be idle to feel sorry for him, because he still has between two and four hundred tons of hay secured from the second and third cuttings, all of it free from this weed and of excellent merchantable quality.

## WHERE TO SECURE ALFALFA HAY

The story of Mr. Jack reminds us that nearly every day in the year we have inquiries as to where Alfalfa hay can be secured. If our friends who wish to purchase Alfalfa hay live anywhere near this region, they would do well to write to Mr. Jack's foreman, W. B. Taylor, at Port Conway, Virginia.

# CORN

The farmers of America owe to Professor P. G. Holden a debt of gratitude which they will never be able to repay. We are fortunate enough to count Professor Holden among our friends, for which fact alone we are extremely grateful, and we are also fortunate enough to have received instructions from him, the results of which have been of more monetary value to us than we could estimate. We believe thoroughly, that since adopting in our own crude way his teachings, we have increased our yield of corn twenty-five bushels per acre. We absolutely know that we have accomplished more under his instructions in one year than we ordinarily did in four years before we adopted his system, and we are equally sure that we have by no means reached the limit to which we can go. In fact, we are sure that no one realizes what the limit is at which corn-growers must stop, either in the quantity or the quality of their production. The United States Department of Agriculture places six year average of the yield of corn per acre at 24.9 bushels. If this total average for the United States cannot be doubled by the use of modern methods, then we are very much mistaken, and we believe Professor Holden's methods will come nearer to accomplishing this end than any that have been given us up to the present time. Just think what this means to the United States at large. A four billion bushel corn crop per year instead of two billions!

We cannot hope to interest every farmer who reads our little catalogue to the point of adopting Professor Holden's system, but if we should be able to induce one out of every ten who reads it to do so, we will feel that we have accomplished a great deal, and that this one result alone would pay us for the labor and expense of preparing this catalogue. In order that you may not think that we were entirely behind the times before meeting Professor Holden, we will say that we began trying to improve our corn a long time ago. In fact, our father had a type of corn which he had worked on for a life-time, and which represented pretty accurately his ideal at the time of his death, some seventeen years ago. We, as his children, have always tried hard to improve the corn that we grew each year, but until the new and scientific methods were discovered, it was slow and up-hill work. Now, as to what these methods are. Like every other great invention or great principle, they are surprisingly simple, and we only wonder that our great-grandfathers did not think of them. In the first place, seed corn must be taken care of. It must be taken in from the fields before heavy frosts come. This is a very simple matter and requires no additional expense. We very easily arrange a contrivance that keeps the corn in such shape that no ears are piled on top of each other, that the air has free circulation, and that the mice are kept away, by simply stringing two wires back and forth across a frame. The rows of ears are laid on these wires, and the whole thing is then placed in the furnace room, where the corn is dried out perfectly. Then, in the spring, each ear that is meant for seed should be tested for germination. This operation is a trifle tedious, but it is inexpensive, costing from 50 cents to \$1.00 a bushel according to the economy of your methods and it insures a perfect stand. We feel sure that by this one detail alone we increase our yield per acre ten bushels every year over what we would secure with ungerminated corn. You must remember that one large ear of corn will plant about one-twelfth of an acre, and consequently, if you have one bad ear to a bushel of seed that you plant, you will have far from a perfect stand.

More than the care of the seed though, in fact, we think more important than any other thing in the management of corn, is the breeding and selecting of the seed. For many years we know pretty well what we wanted in the way of a breed of corn, and we were working to obtain it, but it took Professor Holden to show us how we could get it in one man's ordinary life-time. For our own use, we wanted a variety of corn that would do well on both fertile and poor land, so we chose a white corn, or rather white cap, which we have found will stand a poor ground better than the yellow sorts, and will also do as well on fertile soil as any other kind. Then we wanted a variety that could use as long a season as we could give it. This in our latitude, which is about the same as Columbus, Ohio, is about one hundred and twenty days. You must never expect a variety that must mature itself in ninety or one hundred days to yield as much as one that uses one hundred and fifteen or one hundred and twenty days, any more than you yourself can do as much work in ninety or one hundred days as you can do in one hundred and fifteen or one hundred and twenty days. We wanted our corn to be uniform, so that it would look like it was some particular breed and not a mixture or combination of breeds. Professor Holden taught us not only how to do these things, but much more besides. We would advise you to write to the Simmons Publishing

Co., Springfield, Ohio, or to Professor Holden himself at Ames, Iowa, for his little book, the "A B C of Corn Culture." It only costs 10 cents postpaid, and you will find it of great value to you.

Stake.		Stake.
1. ....		12. ....
2. ....		11. ....
3. ....		10. ....
4. ....		9. ....
5. ....		8. ....
6. ....		7. ....
7. ....		6. ....
8. ....		5. ....
9. ....		4. ....
10. ....		3. ....
11. ....		2. ....
12. ....		1. ....

We have not space here to tell you everything that one should know about corn, but we will give you briefly the main idea in regard to actually breeding seed corn. The most important thing about this is the use of the ear row test plot. In your spare time during the winter, you must first carefully select twelve of your finest ears of seed corn. Choose ears that are as uniform as possible, and those that represent the type which you wish to perpetuate. At corn planting time, prepare a small corner of your farm which is not close to other corn, or if it must be adjacent to other corn, be sure that this corn is of the same variety as you will breed in your test plot. Number each of your selected ears by fastening a numbered paper to end of the cob by a nail or pin. Shell one-half of each ear lengthwise for seed, and save the other half with its number for future reference. Then number two sets of stakes from one to twelve to mark the rows. *We will reproduce a little diagram showing the proper way to plant each of these ears.* You will notice from this diagram that one-fourth of ear No. 1 plants one-half of your first row, and one-fourth of ear No. 12 the other half. In your second row, ear No. 2 plants half, and ear No. 11 the other half. In your third row, ear No. 3 plants half, and ear No. 10 the other half. The reason for making one-half of each row from different ears is to secure as thorough cross-fertilization as possible. The purpose of the duplicate stakes is to enable you to distinguish the yields from the different ears at husking time. Tend this plot just as you do the rest of your field, and when you husk it, be careful to keep the yields from each ear separate and to weigh them separately. Better attend to this yourself and not leave it to the hired man, as he will not realize the importance of accuracy in this part of the work.

The first year, if you are using a variety of corn that is not pedigreed, you will probably find that your test rows will vary from forty bushels per acre to one hundred and twenty bushels per acre, at least that was our experience. If you are trying to secure a heavy yield, and if you find that the ears which matured one hundred and twenty bushels did not seem too late, you should discard everything in the rows that produced less than about one hundred bushels per acre.

When weighing the corn from the test plot, bring out your half-ears that you saved at planting time, and compare them with the yields from the halves that were planted, and this will teach you more about corn than anything you can do. You will learn what constitutes the best yielding type, and the type that reproduce themselves so as to give the highest quality better by comparison of the yield with the original than by trusting to your memory.

The second year you will find that your test plot will run very much more uniformly than it did the first year, and in five or six years' time you will have the corn quite uniform, and, if you have used some skill in breeding, it will be somewhere near the type which you have been seeking.

The first year we had our test plot, we were able, after discarding the low yielding ears, to save enough good seed to plant twenty acres. To prevent in-breeding each year, we use from four to seven of the finest ears which we can find in the test plot for the next year's test plot, and the remainder we select from the general fields. We think it would be unwise to select the entire twelve each year from the previous year's test plot, as that is too close breeding. However, after the second year, we are able to select not only all the corn for the test plot from corn that originally came from a test plot, but we are able also to save all our seed corn for the general field from some of this pedigreed corn. That is, the first year we planted about twenty acres from seed taken from the previous year's test plot. The next year we saved all our seed corn from this twenty acres. Before studying Professor Holden's system we had brought our corn up to a yield of about sixty-five bushels per acre, and we actually thought it probable that this

was as much corn as we could grow on our land and with our climate; but we have actually increased this yield from four to ten bushels each year, until this year we have forty-five acres that have averaged one hundred bushels per acre, and this on an old Ohio farm that has had no virgin soil for many years.



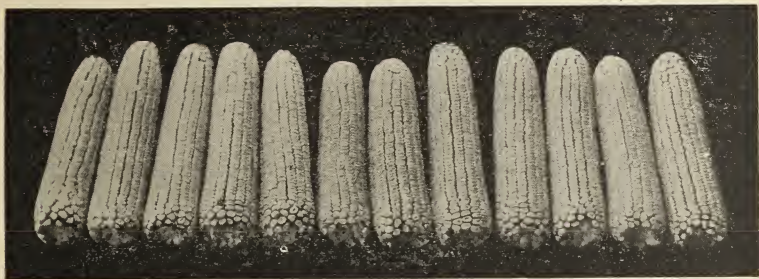
*45 Acres that have averaged 100.1 bushels per acre this year.*

We think this yield is almost entirely owing to the breed of corn, and certainly we have been paid a thousand times over for the little extra work which we did in improving. You will note that our first year showed in the test-plot a yield varying from forty to one hundred and twenty or one hundred and twenty-five bushels per acre. This demonstrates conclusively that we had some very high yielding breeds and some very low yielding breeds. All the corn which did not yield one hundred bushels or over in the test-plots has been discarded now for a number of years, and all of the corn which we grow in the general field traces directly back to these high yielding strains of different years' test-plots. It is no exaggeration to state, that whereas, before using this system we were barely able to increase our yield one or two bushels per year by seed selection, since adopting Professor Holden's methods we have increased from four to ten bushels per year. The whole matter is resolved down to a case like this: In the general field, no matter how carefully we select the corn, the best ears are certainly crossed with corn from near-by hills which may be decidedly inferior to the seed which we select. In the test-rows the corn is all good, and seed selected from this must not only be good of itself, but also well bred. The seed we select from the general field may be good of itself, but it may be of a low yielding strain or of a strain decidedly lacking in quality. In the test-rows we reduce chances of this to a minimum.

#### **WING'S IMPROVED WHITE CAP CORN**

It is seed from the forty-five acre field described above that we are offering to our customers today. As previously stated, this is what we call a White Cap Corn. This simply means that at some time it was a cross between the pure white and the pure yellow. As a result, we get today corn showing a faint yellow tinge to the grain, sometimes with red cob, sometimes with white. The ears are long, as we find that a long-eared variety under adverse conditions will out-yield a short-eared variety, and under favorable conditions also. Possibly, these ears will average ten inches in length. The grain is of excellent length, and is moderately rough, this being the type for which we have worked for fifteen years. The cob is of moderate size, just large enough to give the grain a strong constitution. The shank is of excellent size. The fodder is rather large, not so large as that of Southern corn, but a trifle larger than the average corn grown in our neighborhood. We do not claim this variety to be beautiful, for we have tried to get results first and beauty last, and that is what we have today, just a large heavy-yielding variety of corn, one that makes good under all conditions, one that frequently is beautiful,

but if it is not beautiful, we are not disappointed so long as it gives us the yield that we want. This corn has been carefully selected from our fields which have the best pedigree. It has been carefully dried in our steam-heated warehouse, and we are willing to guarantee its germination to be excellent, provided that it be given a fair test upon being received by our customers. We have tested this corn repeatedly in comparison with varieties from our neighbors, with show corn which we purchased in different localities, and with other varieties of our own raising, and we have never yet placed any variety of corn beside it that exceeded it in yield, and the only ones that even equaled it were the types that can only be grown in safety farther south than this latitude. This corn needs one hundred and twenty days to mature with an ordinary season. Only once since we have been growing it has it been injured by frost, and that was last year. This year it matured in splendid shape long before any frost.

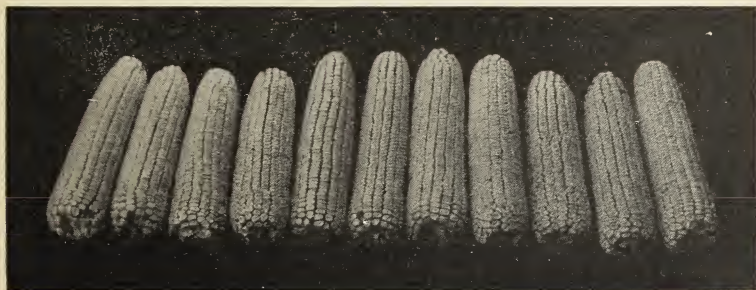


*Wing's Improved White Cap Corn.*

We would caution farmers, however, not to move Wing's White Cap Corn far north, or if they do so, to try only small amounts. Seed corn is peculiar in that if it must be moved at all, it should be moved south, not north. If moved east or west on its own latitude, it will not do quite so well, especially during the first and second year, as it does when not moved. This condition we cannot explain, but it is invariably true. We have cautioned our customers in this regard ever since we began selling seed corn, and in consequence, those living north of us have tried it in moderate quantities at first, with the result that none of them have taken undue risks, and are therefore pleased with their results. We have been quite successful in moving this corn in its own latitude, and very successful in moving it south.

#### **WING'S ONE HUNDRED AND TWENTY DAY WHITE CORN**

Some of our customers object to Wing's Improved White Cap, because, as they very truly state, it is a cross-bred corn. To these we would recommend this One Hundred and Twenty Day White Corn. It is a pure white variety, and has many points to recommend it. It is perhaps a few days earlier in maturing than our White Cap. The ears are not quite so long. Perhaps they would average an inch

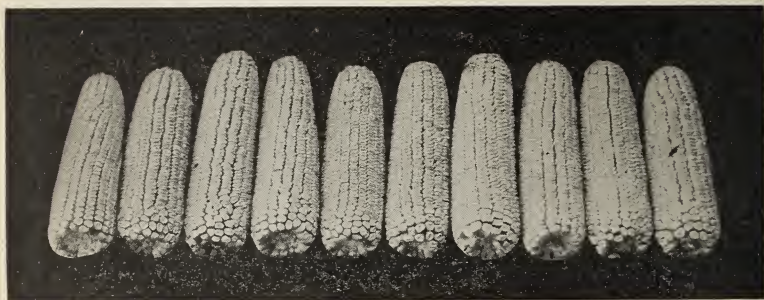


*Wing's 120 Day White Corn.*

shorter than the White Cap. The cob is of excellent size, neither too large nor too small. The depth of grain is excellent. The corn is rough, a trifle rougher than the White Cap. The butts and tips are well covered, and the corn is quite uniform. This corn has produced one hundred bushels per acre on moderate-sized acreage, and we are sure that it will give a very good account of itself when given anything like good conditions. Fodder is medium to large, about the same size as Wing's Improved White Cap.

#### WING'S ONE HUNDRED DAY WHITE CORN

This variety we do not hesitate to recommend to those who live north of us. As its name indicates, it matures in about one hundred days, and we are frank to say that it is of excellent type, that it is the kind of corn that will make the most of its opportunities in the length of time it has in which to mature, and that in beauty it probably has the Improved White Cap beaten about a mile. It is remarkably uniform, and it is the type of corn from which show ears can usually be selected. The ears range from seven to nine inches in length. The proportion of grain to cob is excellent, the covering of butts and tips is very fine, and the weight of the ears in proportion to their size is unusually good. It is a pure white variety. We cannot see how it would be possible for this corn to yield as heavily as the Improved White Cap or as Wing's One Hundred and Twenty Day, but many of our customers cannot use as late a variety as either of those, and to them we

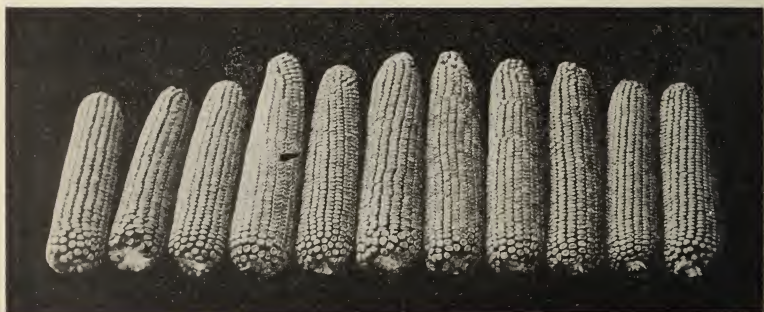


*Wing's 100 Day White Corn.*

recommend the One Hundred Day White Corn without hesitation. Fodder is medium-sized, a little smaller than the average of fodder in this section.

#### REID'S YELLOW DENT

Everybody knows what Reid's Yellow Dent corn is and we do not think it necessary to give a description. This is pure seed and good seed. It is a few days later in maturing than the Wing's Improved White Cap. It is probably the heaviest yielding yellow corn grown in this country and will fall not very far



*Reid's Yellow Dent.*

below the Improved White Cap in this respect. The ears are long, about the same length as Wing's White Cap. The cob is of sufficient size to give strong constitution. The depth of grain is a trifle less than with our White Cap. The grains are also a trifle smaller, and the ears and grain are somewhat smoother than Wing's White Cap. We recommend this corn to those who love Reid's Yellow Dent variety, and the only caution which we would give in regard to it is that we would not move it ten miles farther north than it is now. Fodder medium to large.

#### WING'S ONE HUNDRED AND TWENTY DAY YELLOW

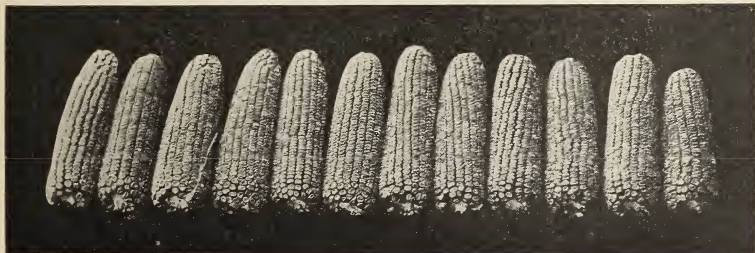
This is a pure yellow variety which ripens almost exactly with our White Cap. The ears are of very excellent size, and the general type of corn we like very well indeed. That is, we think it very well adapted to this latitude and a variety that will certainly make good anywhere that it has a fair chance. The depth of grain is excellent. The form of ear, the proportion of corn to cob and the shape of grain is about all that could be desired. The corn has proven itself to be a very heavy yielder for as many years as we have had it under observation, and we take pleasure in recommending it as one of the very finest breeds which we know of for this latitude.



*Wing's 120 Day Yellow.*

#### CLARAGE CORN

This variety is known the country over and is one of our most valuable kinds. Some of its growers claim that it will mature in ninety days. Our observation has been that it needs about ninety-five or one hundred, but certainly it is a very early variety, one that could be safely moved north, and one that will make good, as it does just as well as possible for every day which it has during its growing and maturing time. It is unreasonable to expect one hundred day corn to produce as many bushels per acre as one hundred and twenty day corn, but this corn will mature as much corn in one hundred days as any variety of yellow corn which we know of will mature in the same length of time. The quality is very good



*Clarage Corn.*

indeed, having great depth of grain and very good uniformity, excellent covering over butts and tips. The proportion of grain to cob is very good. We unhesitatingly recommend this variety for those who live north of us or for those who need a quick maturing variety for late seeding. Fodder medium to small, averaging considerably smaller than the average corn as grown in this country.

### SHIPPING SEED CORN

We are willing to ship our seed corn either on the ear, which gives our customers an opportunity to see just what kind of corn they are getting, or to nub the corn, shelling off the butts and tips, shelling the remainder for seed corn and running through our grader and cleaner, just as our customers prefer. The latter method makes more work for us, but in some ways, has advantages over shipping on the ear. The corn reaches you all ready to plant; besides the probabilities are that you will get better weights than when it is shipped on the ear, for the reason that no method which we have found so far will prevent some of the corn being shelled on the road. Perhaps only a pound or so, but sometimes several pounds out of each bushel. While the railroad company is supposed to be responsible for this loss, they sometimes make us a great deal of annoyance and trouble when trying to collect claims of this nature.

We find that the Wing's Improved White Cap shells about as little as any variety that we ship, and that the Clarage and Wing's 100 Day shell about as badly as any, for the reason that the larger the ears, the more compactly they fill the crates, and there is less friction, and, consequently, less shelling than in the smaller varieties.

Frankly, we are sure that shipping corn shelled is a much more practical way than shipping it crated, provided that you have a seedsman whom you can trust. We send out very little corn crated where there is not some loss from shelling on the road. It may amount to only a little, but it sometimes amounts to as much as ten pounds per bushel, which is a serious loss. Where it is not specified whether corn shall be shipped on the ear or shelled, we use our own judgment. The shelled corn is absolutely the same quality as the ear corn. We have no second grade corn in our warehouse.

We have built up our business so far almost entirely on the merits of our seeds. Only a little of it has been due to our advertising. In fact, we spend less money in advertising than any other firm that we know of that handles as large a business as we do. We are able to do this simply because men who have used our seeds once, come back the second time, and also refer their neighbors to us. If it were not for this fact, we could not begin to sell the high class seed which we do without charging higher price.

Our Seed Corn was all carefully selected this fall before heavy freezes. It was placed in our large, steam-heated warehouse in such manner that practically the ears do not touch each other excepting a little on the sides. This gives splendid circulation of air, and we have been able to dry the corn out in a very short time and to leave it in splendid condition. Our warehouse never freezes throughout the winter, and this corn will certainly have the strongest possible germ in the spring, much stronger than corn that has been exposed to the winter's freezing in cribs.

Our corn is selected from the finest strains, having the best possible breeding behind it. As long as such corn is obtainable, we think no farmer can afford to plant ordinary corn on his farm.

### THE PRICE OF SEED CORN

Just a word here as to the price of seed corn. As compared with the results obtainable with the high-yielding, fine varieties of today, the price charged by any seedman is ridiculously low. Take wheat, for example. The farmer pays \$2.00 per acre for his seed wheat. On one acre perhaps he will grow twenty bushels; and if fortunate, he may secure \$1.00 a bushel, or \$20.00 per acre; thus, for \$1.00 invested in seed wheat he secures \$10.00 in grain.

One bushel of seed corn will plant about six acres. If the farmer secures sixty bushels per acre, paying \$3.00 per bushel for his seed, and sells this sixty bushels of corn at 50 cents a bushel, he obtains \$30.00 an acre at an expense for seed at 50 cents for that acre. On the same ratio that he pays for his wheat, he could pay \$18.00 a bushel for his seed corn, but if he is getting a variety of corn that will yield one hundred bushels per acre, he could afford to pay \$30.00 for his seed corn.

# CLOVERS

The value of the clovers upon the farm can hardly be overestimated. They feed the soil and restore it to its original fertility, or even build it to a greater degree of fertility than it ever possessed. The best feed for all farm animals, clovers are rich in protein, that indispensable element that builds the red flesh and blood of the young animals, and that makes milk in the mothers.

In all lands where agriculture truly flourishes clovers are much prized, and where agriculture has reached its highest development there clovers are much used. A field of clover upon the farm is a sign of good land, and a good man managing that land. It is a sign of continuance in prosperity, and of increasing wealth in years to come.

The story is often told that clovers do not thrive on old farms as they once did, but the reason of this is not far to seek—much of the virgin of the fertility lay in the stores of the humus, and this long continued cropping has exhausted. Clovers build up land, it is true, yet they need to be fed before they are set to work. Then from various reasons old soils have frequently become acid in their nature, and few clovers can endure an acid soil.

The remedy for acidity of soil is lime, and in all regions where agriculture has reached a high stage of development the use of lime will be found a regular farm practice, unless, indeed, there should be already sufficient lime mixed with the soil to prevent acidity. Millions of acres of unprofitable lands in the eastern part of America need a thorough liming as the first step toward a new fertility.

Clovers enrich soils mainly by their ability to assimilate the nitrogen of the air, and this is done by bacteria living upon the clover roots. These digest the air that that is in the soil, and appropriate its nitrogen. In acid soils these bacteria cannot thrive, thus a sufficiency of lime is the first requisite for successful clover growing.

## DRAINAGE

Nearly all clovers thrive best in well drained soils, because in such soils the air penetrates and the bacteria thrive, therefore, along with liming should go drainage. If the soil is very heavy tenacious clay, it should yet further be loosened up by applications of coarse manure of any sort, even straw buried in the soil will aid in giving it life, and prompting clover growth.

Tile underdraining, supplemented by lime and coarse manures, will bring luxuriant growths of clover, and this in turn will be followed by great crops of anything that may be planted thereon.

## FERTILIZERS

Clovers also feed vigorously upon potash and phosphorus, so in applying fertilizers one should bear in mind the requirements of his clovers, and cater to their appetites, for by so doing he will stimulate their growth, and they in turn will feed the land for subsequent crops.

## RED CLOVER

Red clover has long been the stand by the American farmer, and is in fact prized in other lands, although nowhere sown so exclusively as in America.

There are two principal varieties of red clover—the Common, *Trifolium pratense*, and the Mammoth, *Trifolium pratense perenne*.

The Common red clover is best for hay, and for rich soils. The Mammoth is best as fertilizer, and to be sown on bare or impoverished soils.

Red clover is almost a biennial plant. Sown in the spring it makes a moderate growth the first year. The second year blooms profusely, makes seed, and most of it dies. It is not usually profitable to keep meadows of red clover past a second year, although when grasses are sown with the red clover they will come on after the clover is gone, and continue the sward. A partial exception to this is the Mammoth—it is almost a perennial.

## IMPORTANCE OF GOOD SEED

Red clover seed, is often badly mixed with injurious weeds, such as buck-horn, plantain, dodder, etc. Great care should be exercised in purchasing clover seed since life is too short to be spent in eradicating unnecessary weeds.

We handle an export grade of Red Clover, which we call our W. B. brand. It is of a quality so superior, that we are forced to ask a rather high price for it, but there are very few seedsmen handling anything as good as this is. Many of our customers have been surprised when they saw our seed, and they have stated to us that they have never seen any Clover Seed as good as ours.

#### MANNER OF SOWING

In the region of the corn-belt red clover must be sown in the spring or late winter. A very common practice is to sow it on the snow in the wheat, and this rather crude method is often successful. A much better practice, however, is to wait until the growing weather has set in in April, then to harrow the ground and sow the seed broadcast, covering it up again by lightly harrowing in a transverse direction. This harrowing will more likely benefit than injure the wheat, and will result in a far more perfect stand than one is apt to secure by sowing broadcast and not covering at all.

#### NURSE CROPS FOR RED CLOVER

Red clover really thrives better with no nurse crop at all, although a greater profit is usually secured by growing it with some grain. The best spring grain crop for sowing with red clover is beardless spring barley. This barley, while not making the most bushels nor perhaps the highest quality of barley, is a splendid nurse crop for any varieties of clover because of its habit of ripening early, its ability to stand erect without lodging upon most soils, and its habit of letting the sun in upon the clover.

In sowing clovers with barley one should use about 2 bushels of barley to the acre, and 10 or 12 pounds of clover seed, when he will almost certainly secure a splendid growth of clover the same year, cutting the barley for grain in the usual manner. It is well to cut the clover that same year if it grows so rank that it permits it to bloom, since it will often die the first winter should it bloom profusely.

Oats are also permissible as a nurse crop for clover, though they should be sown more thinly than is the usual habit, and if an early variety is chosen, all the better.

To surely secure a stand of clover with either oats or barley as a nurse, it is only necessary to cut the nurse crop for hay when it is in bloom, or a little later while the grain is in the milk, and a magnificent stand will surely follow.

Some of the highest authorities recommend sowing red clover in the fall without a nurse crop, as being the most certain method of securing a good stand and a good crop of hay the following year. This is recommended to be done in August.

Red clover will, for many years, continue to be the stand-by of the American farmer east of the Missouri river, although here and there a man will be found who desires something better, and the better thing is alfalfa. Clover has this advantage over alfalfa, however, that it will thrive on poorer soil with less care and attention, although it will never make so great a profit. The man who wishes some day to grow alfalfa should always mix a small percent of alfalfa seed with his clover, say 10 per cent. This will give him a fair indication of the adaptability of his land to alfalfa culture, and at the same time be inoculating the soil with the alfalfa bacteria, and will make it easier to secure a stand of pure alfalfa, later.

#### SWEET CLOVER

Biennial, Height 3 to 6 feet

This clover is grown for a variety of purposes. In the South it is much prized for hay and extensively grown for this purpose, but in the North stock refuse to eat it unless it is mixed with some other variety of hay, such as Alfalfa. On any impoverished land, this plant may be of great value, as it will grow on soil that is badly exhausted, and will build up the soil by the nodules on its roots, or it may be plowed under with even more beneficial results. Care must be taken that it does not take to the fence corners and become a weed. This plant is a biennial, and if it is not allowed to seed, it will disappear at the end of the second year.

Growing Sweet Clover as a preparation for Alfalfa is to be recommended. The same bacteria that work on the Alfalfa are also found on the Sweet Clover roots, and for some reason, the Sweet Clover will grow on any soil, apparently bringing its own inoculation with it. Thus it will inoculate your field, and in addition, its rank growth makes excellent green manure when plowed under. The only warning must be, as before stated, not to allow the plant to become a weed.

*White Clover.*

with the little white clover predominating.



# Price List No. 1.

These seeds are described in our Catalogue. Prices are for immediate acceptance only, and subject to prior sale. Will probably be changed about once a week on many seeds.

Samples sent upon application. Sample Ear Corn, 15c postpaid.

BAGS—On seeds marked 1, jute bags are free with any amount purchased, but are weighed in, gross for net. On seeds marked 2, bags are free up to bushel lots (weighed in, gross for net), BUT ABOVE BU. LOTS ADD 20 CTS. EACH FOR SEAMLESS, OR 10 CTS. EACH FOR JUTE BAGS. Shipments double sacked add 20 cents for extra bag.

NAME OF SEED.	MARK.	Price per pound Postpaid	10 lbs not prepaid.	30 to 60 pounds per pound.	60 pounds	100 pounds	10 bu. lots per bushel
2 Alfalfa	No. 1	\$ .50	\$2.20	\$ .31	\$12.00	\$20.00	\$11.75
2 Clover, Red	Prime	.45	1.70	.15	6.75	11.25	6.65
2 Clover, Red	W. B.	.45	1.80	.15	7.25	12.08	7.15
2 " Mammoth	Prime	.45	1.70	.15	6.75	11.25	6.65
2 " Mammoth	W. B.	.45	1.80	.15	7.25	12.08	7.15
2 " Alsike	Prime	.45	1.90	.17	10.00	16.67	9.85
2 " Alsike	W. B.	.45	1.90	.18	10.50	17.50	10.40
2 " White	Chap	.45	2.50	.18	10.50	17.50	
2 Sweet Clover (Melilotus)		.45	2.50	.18	10.50	17.50	
2 Crimson Clover	No. 1	.45	1.10	.10	4.00	6.67	
2 Timothy	W. B.	.30	1.00	45lb \$2.40		5.34	2.35
1 Orchard Grass	Myr	.30	2.00	50lb 9.25		18.50	
2 Red Top	W. B.	.30	1.75	50lb 9.00		18.00	
1 Bromus inermis	Mel	.30	1.50	" 4.25		10.50	
1 Tall Meadow Oats	Mos	.30	2.00	" 9.00		18.00	
1 Kentucky Blue Grass	S.U.	.35	2.50	" 6.50		13.00	
1 Kentucky Blue Grass Strippings		.25	1.00	" 4.15		8.25	
1 Canada Blue Grass	Mat	.30	1.50	" 5.00		10.00	
1 Meadow Fescue	Dash	.30	1.50	" 6.00		12.00	
1 English Rye Grass	No. 1	.25	1.25	" 4.50		9.00	
1 Sheep's Fescue	No. 1	.25	1.50	" 5.00		10.00	
1 Tall Meadow Fescue	No. 1	.50	4.50	" 13.00		26.00	
1 Creeping Fescue	25	.25	2.00	" 8.00		16.00	
1 Lawn Mixture		.35	2.75	20lb 3.50			
1 Dry Pasture Mixture			2.00	50lb 7.50		15.00	
1 Moist Pasture Mixture			1.80	50lb 7.00		13.75	
2 Jap Millet	817	.25	.60	50lb 3.50		7.00	
2 German Millet, (Tenn. grown)		.25	.50	50lb 1.75		3.50	
2 Hungarian Millet				48lb 1.25		2.50	
2 Pearl Millet		.35	.75		.70		
2 Buckwheat				50lb 1.50		3.00	
2 Kaffir Corn		.25	.50	50lb 1.00		2.00	
2 Sugar Cane	No. 1	.25	.60	50lb 1.50		3.00	
2 Spring or Sand Vetches			.60	60lb 3.00		5.00	4.75
2 Winter or Hairy Vetch	No. 1	.30	1.25	50lb 4.25		8.00	7.00
2 Canada Field Peas	No. 1	.25	.60	60lb 1.80		3.00	1.70
2 Soja Beans, (all varieties)			.60	60lb 3.00		5.00	2.90
2 Cow Peas, Whipporwill			.60	60lb 2.00		3.34	1.90
2 Rape, Dwarf Essex	No. 1		.75	60lb 3.65		5.75	
2 Bearded Barley, (Wing's)				48lb 1.25			1.10
2 Bearded Barley, Oderbrucker				48lb 1.25			1.20
2 Beardless Barley	Champion			48lb 1.50		5 bu. 1.40	1.25
2 Oats, (Sixty Day)							
(very choice variety not in Cat'gue)				32lb 1.30			1.15
2 Oats, all other varieties				32lb 1.25			1.05
* Corn, Wing's Imp. White Cap.				1bu 3.00			2.85
* Corn, all other varieties				1bu 2.85			2.70

\*Corn prices are either for shelled or ear corn. Price includes bags or crates. We do not sell less than 1 bu. ear corn, nor less than 1/2 bu. shelled. For shelled corn in 1/2 bu. lots add 20c to bu. price

European Alfalfa crop this year is almost a failure, and American seed will be exported, causing very high prices. We are exporting a little ourselves. We advise early orders before prices become higher.



### ALSIKE OR HYBRID CLOVER



*Alsike or Hybrid Clover.*

This clover appears to be a hybrid, between red clover and the small white or creeping Dutch clover. It has the lower habit of growth of the Dutch clover, although it greatly exceeds it in size. It thrives on moister ground than red clover, and is at its best in rather a cool and moist situation. It usually endures for a number of years when well established. It is not to be recommended for dry soils or hot climates, but in a mixture of grasses for pasture or mowing it is very useful. Bees feed upon it well, and the seed crop is valuable. Alsike hay is exceedingly good.

### WHITE CLOVER

This is a common little running white clover that establishes itself along road-rides and in pastures. It is rather small for hay, but affords a great amount of pasture of very nutritious quality, besides being an invaluable plant for the bees. No pasture should be sown without an admixture of white clover seed, and as it has a habit of running and spreading rapidly over the ground, it is not necessary to secure a thick stand at first.

It is a perennial, and may last for many years, although sometimes it will

seem to come and go according as the seasons prove favorable or not.

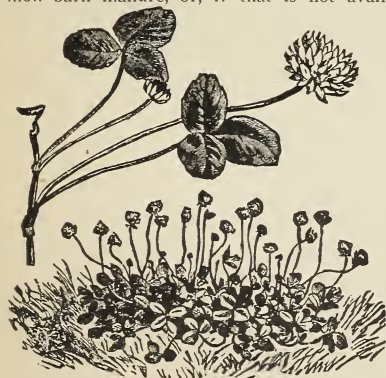
White clover should never be sown as a mixture with alfalfa, since it thrives too well in such companionship, and injures the growth of the alfalfa.

Old grass pastures that are not so productive as they should be may be easily restored to several times their yield by tearing them up with a disc or any sort of harrow, sowing some white clover seed (with other clovers, also, if desired), and then feeding all the plants by a liberal application of fertilizer. This may be common barn manure, or, if that is not available, some of the phosphoric fertilizers

will suffice. These fertilizers are rich in phosphates, having a peculiarly stimulating effect upon clovers, and by inducing rank growth of them cause all the neighboring grasses to share in their thrift.

### REJUVINATING OLD PASTURES

Pastures are usually much neglected in America. In the Old World they are more highly prized, and farmers have learned better than we that they deserve feeding, and that it is profitable to feed them. There it has been learned that to sow liberally of lime and phosphates upon old grass pastures will bring in perhaps, with no seeding at all, a rank growth of clovers. A surer plan in our country, however, is to follow the manuring with a sprinkle of seed, usually a mixture of clovers, according to the nature of the soil, with the little white clover predominating.



*White Clover.*

### CRIMSON OR SCARLET CLOVER

This is the "Trifolium" of England, and in soils suited to it, a grand plant. It is really an annual. Sown in mid summer or in fall, it lives throughout the one winter, blooms and makes seed, and dies early the next summer. It grows from one to three feet high, roots very deeply, is a bountiful storer of nitrogen and makes a mass of dark green leaved stems crowned with crimson or scarlet flowers. It is worth while growing as a flower were it useless as a forage plant.

Unfortunately crimson clover does not thrive well in most of the region of the corn-belt, but along the southern shores of the Great Lakes and along the sea coast, especially in Maryland, Delaware and Virginia, and throughout the South generally crimson clover is a grand success, and coming in between crops it costs practically nothing but the seed. It can be sown in the corn at the time of last cultivation, and turned under any time for a crop of corn next year. Plowing under a good crop of crimson clover is equivalent to applying twenty tons of stable manure.

Like the other clovers it is greatly stimulated by the application of fertilizers rich in phosphates and potash, and the better it is fed the better it feeds the land. As a hay crop it is inferior to alfalfa or red clover, and must be cut before the flowers begin to harden since the seed heads are very unwholesome, and are apt to cause "hair-balls in the stomachs of animals. In England and Europe it is often used as a soiling crop fed to cows or sheep.

Crimson clover is a much more efficient nitrogen gatherer when the land is inoculated with the proper bacteria, and although the first experience with crimson clover may be disappointing, one should persevere until the land is full of nitroifying bacteria, when the grandest results will follow.

From our experience with this plant we recommend its use south of the Ohio river and along the sea coast, and in exceptionally sheltered situations, like the shores of Lake Erie.

## PRICE LIST OF BOOKS

We are agents for books and circulars, on alfalfa.

*Alfalfa* — By D. F. Coburn. 160 pages, cloth. Price, postpaid, 50c. Table of contents includes chapters devoted to history, description, botanical position, varieties, length of life, habits of growth, penetrating of alfalfa roots, climate and soil, food for alfalfa, seed bed and preparation, time of seeding, quantity and quality of seed, method of seeding, nurse crop, treatment of young alfalfa, alfalfa for soiling, harvesting, comparison of yields, scientific feeding, alfalfa vs. corn, alfalfa for dairy cows, for swine, for horses, for sheep, as a honey plant, making a balanced ration, alfalfa in rotation, Turkestan alfalfa, alfalfa culture and insect life, disking and harrowing, enemies and friends of alfalfa, alfalfa in different states.

*Alfalfa* — By F. D. Coburn. Profusely illustrated with about 30 full page plates of fine, clear photographs. Over 400 pages. Price, \$2.00, postpaid.

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We would also recommend to everyone who is interested in growing alfalfa to write to the Ohio Agricultural Station for their Bulletin No. 181, on alfalfa.

The Kansas Experiment Station at Manhattan, Kansas, has a very valuable bulletin on Alfalfa. Write them for Bulletin 155.

Joseph E. Wing has just written a new book containing the most recent knowledge concerning the growing and harvesting of Alfalfa. We can furnish this book for \$1.00 postpaid.

# GRASSES

The most important and valuable of all the plants in the world are the grasses. "Grass is King." It embraces one-sixth of the whole vegetable kingdom, and is the true basis of agriculture in the highest condition. "No grass, no cattle; no cattle, no manure; no manure, no crops!"

It may be wondered why we should list more than one or two varieties of grass. It is true, however, that each soil and section finds a different grass to thrive best, and while some grasses are more assimilative than others, yet each one has its natural habit.

For rich limestone soils with sufficient moisture, Kentucky blue grass is the best of all for pasture; on thinner soils, and more away from the limestone, the Canadian blue grass thrives better; on wetter lands and colder situations, with less lime, the red top is more successful; for rich meadows with abundant moisture, timothy is easily "King"; for dryer situation where drought is frequent, awnless brome grass (*Bromus inermis*), is unrivaled. There are soils where orchard grass is most profitable, and situations where rye grasses and other varieties will give the best results.

Anyone who will stop to think a minute will see that theoretically grass mixtures are bound to be extremely valuable to the farmer, and we wish to emphasize the fact that the mixtures are just as valuable in practice as they look to be in theory. Whenever we seed down a piece of ground for pasture, we use grass mixtures, and in addition to this, we thoroughly believe in disking them in to improve old pastures that are already established in grass. Where you have a variety of grasses growing in the same pasture, there will be some of them that will start very early in the spring, perhaps two weeks earlier than the ordinary pasture grasses. Here is where you begin to get the good of your mixture. After these earliest grasses have come, the others will follow, and probably during the best part of the summer you will have a very luxuriant growth of each one. You will be benefitted by this, not only by a larger yield of forage than you would secure from any one of them, but also by the fact that you will balance your ration, and the stock having so much variety will eat better and do better. Then, during the droughty period of the summer, some of the mixed grasses will do much better than the ordinary pasture grasses, they will stay fresh and green when the ordinary grasses will be dried up, and finally, some of them will be green much later in the fall than the ordinary grasses, so that you will have finer pasturage throughout the entire season from this mixture than you would have from any ordinary kind of pasture.

The expense of having this mixture amounts to little more than where you have only two or three kinds of grasses. For ourselves, we would never be contented to seed a pasture without having a large amount of clover added to the mixture. The several different varieties of clover are all well adapted to this use, and not only do the stock thrive on them, but they enrich the soil at the same time and actually stimulate the other grasses. We prepare a dry pasture mixture and a moist pasture mixture. These mixtures both contain the proper amount of clover and also a large variety of the finest pasture grasses. We would recommend, however, that our customers either re-mix these mixtures upon arrival, or that they order the clover separate and mix it after the seed has been received. This is because in shipping the probabilities are that the clover will settle largely to the bottom of the sacks, and not be properly mixed upon arrival. Upon request we will make this mixture in any proportions which our customers desire and from any varieties of grasses found in our catalogue. If you desire any special mixture or any special proportions, write us before you are ready to order, and we will estimate the cost. Where it is left to our judgment, we will use in the Dry Pasture Mixture, the following varieties of seed: Timothy, Medium Red Clover, Mammoth Clover, White Clover, Orchard Grass, Tall Meadow Oats, Tall Fescue, Creeping Fescue, Sheep Fescue, *Bromus Inermis*, Kentucky Blue Grass, and Canada Blue Grass.

Moist Pasture Mixture: Timothy, White Clover, Alsike, Medium Red Clover, Mammoth Clover, *Bromus Inermis*, Kentucky Blue Grass, English Rye, Meadow Fescue, Sheep Fescue, Tall Fescue, Red Top, Orchard Grass and Tall Meadow Oats.

We advise sowing of the dry pasture mixture thirty pounds per acre, and of the moist pasture, thirty-five to forty-five pounds per acre. These amounts are intended for new pastures which are just being seeded down. In thickening old pastures much smaller amounts can be used to advantage.

We have had many years experience with grasses, and the senior member of our firm has studied them in many states and foreign countries, and it is our desire to sell no seed that will not most benefit the customer, and we wish, therefore, to give the best advice within our power to every man that buys from us.

**AWNLESS BROME GRASS, *Bromus Inermis***

Perennial, height, 3 to 5 feet



*Bromus Inermis.*

This is a grass of comparatively recent introduction, although it has long been known and highly prized in Europe, especially in the dryer parts of Eastern Europe. Of the first importation made by the United States government, a few bushels of seed were sown on Woodland Farm, and some of this grass is still in existence. It is one of the most persistent grasses that we know, in fact this very persistency is sometimes urged against it, yet we have never failed to destroy it when we desired to plow and plant the field to corn.

Brome grass resembles orchard grass some in its appearance, although of an entirely different manner of growth, since orchard grass grows in bunches and brome grass makes a dense sod all over the ground. A thin stand of brome grass will soon thicken up and be thick enough. In truth, its tendency is to become too thick on the ground. We have found brome grass to be the hardiest of all the grasses, affording a "bite" earlier in spring and growing later in the fall than any other. Moreover, animals relish, it greater than any other grass whether for pasture or for hay.

We do not recommend brome grass so much for the meadow in Eastern sections as for pasture, although in dry Western states it is perhaps the best meadow grass. In sowing brome grass for a pasture in the regions of the corn-belt it may be mixed with Kentucky blue grass, but should never be mixed with orchard grass, since animals relish the brome grass so much better than they do the orchard grass that they will graze only upon the brome grass as long as it can be found, and under such treatment it will presently disappear.

Sown by itself it will stand almost any amount of close grazing, and if given a little opportunity it will soon recuperate and thicken again.

Clovers or alfalfa should usually be sown with brome grass, since it thrives better for their company, and the grazing yielded is far more nutritious. It thrives well with red clover, little white clover or alfalfa. When alfalfa is sown for pasture it is well to sow a small amount of brome grass along with it, since then it yields a better balanced pasture ration, and animals thrive better than if eating the pure alfalfa alone. Furthermore, the danger of bloat in pasture is very much reduced if they can graze a mixture of alfalfa and brome grass.

Brome grass seed is often very seriously adulterated with cheaper and inferior seeds, or with seed that has lost its vitality. Only fresh seed will grow well, and only pure seed is worth sowing. It is easy to establish brome grass from good seed. The ground should be mellow and in good heart, and the seed sown at the rate of from 20 to 25 pounds per acre in early spring or summer. When alfalfa is sown with it, however, a much smaller quantity should be used. It needs to be covered lightly, and it is well if the ground is firm, though it should not be hard.

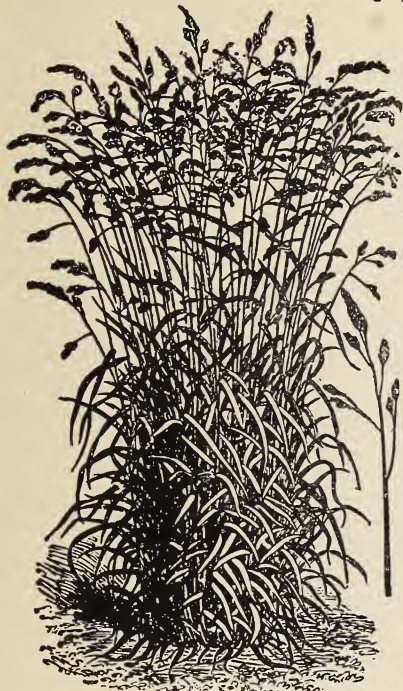
We find this grass well adapted to low and rather swampy ground, even where occasionally subject to overflow. On such soils it sometimes yields enormous quantities of good hay. While we have never weighed the hay from it, it has apparently produced four or five tons per acre for us.

In the course of years if the brome grass sod becomes so thick that the growth is retarded, it may be stimulated again by thorough disking, the sowing of clover seeds an application of manure, either from the barnyard or of mineral fertilizers.

We have no hesitation in saying that brome grass, in most of the regions of the corn-belt, will yield more and better pasture than any other grass, its only defect being that it seems a little hard to get out of the soil in situations where thorough tillage is difficult or impossible.

#### ORCHARD GRASS

Perennial. Height, 2 to 3 feet



*Orchard Grass.*

One of the most vigorous and productive grasses adapted to either meadow or pasture, and well suited to some regions where Canada blue grass and other grasses do not thrive. It is more vigorous than Canada blue grass, and yields much more forage; it is not, however, of so high a quality. It is relished by horses and most animals as pasture, but should be sown in a field by itself, so that when animals are turned to it they have no alternative but to eat it, else they will eat the other grasses too closely while neglecting the orchard grass.

It comes very early in the spring, and may be cut for hay in June, after which it will yield a great amount of aftermath. It stands drought well, and is tolerant of poor soils and shade. It should always be sown in connection with clovers of one sort or another, since it thrives better and makes better grazing.

Sow in the spring, 20 to 25 pounds per acre, on well prepared soil, covering lightly. Red top, tall meadow oat grass or Canada blue grass may be sown in connection with orchard grass.

#### TALL MEADOW OAT GRASS

Perennial. Height, 2 to 4 feet

This grass is recommended for permanent pastures on account of its starting so early in the spring, as well as furnishing abundance of late feed. It prefers deep, sandy soils, or soil on which clover thrives. Sow 40 to 50 pounds per acre.

#### ENGLISH OR PERENNIAL RYE GRASS

Perennial. Height, 15 to 24 inches

A valuable grass for permanent pastures, or for lawn mixtures. It produces an abundance of fine foliage, forms a compact sward, and remains bright and green throughout the season. If cut while in bloom it is a nutritious variety for hay, although it become woody later. Thrives best in soil that is not too dry. Sow (if alone) 60 to 70 pounds per acre.

#### RED TOP

So well known as to hardly need description. It is often sown with timothy and red clover to make a heavier yield of hay. It prefers moist, rich soil on which it should reach a height of from two to two and one-half feet. It is also recommended in parts of the country as valuable grass for permanent pastures. Sow (if alone) about 40 pounds per acre.

## KENTUCKY BLUE GRASS

Perennial. Height, 10 to 15 inches

This is also too well known to require description. We recommend sowing (if alone) about three bushels per acre.

This year we are selling both the Fancy Re-Cleaned Kentucky Blue Grass and the Blue Grass Strippings. It is a recognized scientific fact that unhulled grass seeds possess greater vitality than hulled ones. A friend who has had a great deal of experience with these grass strippings, advises us that he never has any trouble with the germination, and that he can always secure a more uniform stand than from hulled and cleaned seed. You will understand that these strippings include the stalk just as the plant is mown, but the most of the weight is actually with the seed. They require sowing by hand, and sometimes the bunches must be picked apart to prevent too much falling in one place. After scattering the seed, a weeder or light



*Kentucky Blue Grass*

harrow should be run over them to cover lightly.

## TALL MEADOW FESCUE

Perennial. Height, 3 to 4 feet

A rather coarse grass but very nutritious and productive, especially adapted to clay soils and shady woods. It is greatly relished by all stock when green, and is highly recommended for all permanent pasture mixtures. It also makes good hay. Sow (if alone) about 35 pounds per acre.

## RED OR CREEPING FESCUE

Perennial. Height, 2 to 2 1-2 feet

This grass is recommended on account of its ability to withstand drought. It roots deeply in the soil, and remains fresh and green when other grasses are apparently dried up. It yields a good bulk of herbage of fair quality. It is most nutritious at time of flowering. Sow (if alone) about 35 pounds per acre.

## MEADOW FESCUE

Perennial. Height, 18 to 24 inches

One of the most highly recommended of our natural grasses. It is very nutritious and greedily eaten by all kinds of stock, and very fattening. It makes good hay, succeeds well on many kinds of soil, although best on moist land. One of the earliest grasses to start in the spring, and one of the latest in fall. (Sow (if alone) about 55 pounds per acre.

## CANADA BLUE GRASS

Perennial. Height, 6 to 12 inches

Succeeds on soil too poor for Kentucky blue grass. It is well relished by stock, and especially recommended for cows. It should form a portion of the mixed grasses for permanent pastures in most parts of our country. Sow (if alone) about 40 pounds per acre.

## SHEEP'S FESCUE

Perennial. Height, 6 to 20 inches

This grass is especially recommended for good upland or dry pastures, and for sheep grazing, being very much relished by them. It is slightly deficient in quantity of forage produced but it is so nutritious as to counterbalance this deficiency. It is also recommended for lawn mixtures. Sow (if alone) about 30 pounds per acre.

## TIMOTHY

So well known as to need neither description nor recommendation. We recommend sowing 20 to 45 pounds per acre. We handle only the very best seed, an export grade sold by few other firms.

# MILLETS

## JAPANESE MILLET

A tall growing and enormous yielding variety. It is sometimes 6 to 8 feet high. Does not lodge, and sometimes yields from 10 to 12 tons of green fodder per acre. When properly cured it makes excellent hay. It is recommended that this variety be sown on good rich soil, and only in the northern states as it does not thrive south of the Ohio river. If sown early in May and cut when in bloom it will produce a fair second cutting. May be sown from the middle of May to the first of July. Broadcast, 15 pounds per acre, but it is better to sow in drills, 12 to 14 inches apart, using 10 to 12 pounds per acre, and hoeing between the rows to keep down the weeds until the plant is a foot high or over, after which time it will smother all weeds out itself.

## HUNGARIAN MILLET

It is the quickest maturing of any variety of millet. May be sown any time during the summer up to the middle of August, thus being very valuable to substitute where another crop has failed. Sow about 48 pounds per acre.

## GERMAN OR GOLDEN MILLET Tennessee Grown

This stock is much preferred to the same seed Western-grown. Will grow in any climate or soil, and make a large yield of nutritious feed. Should be sown at the rate of 50 pounds or over per acre, any time between May 1st and June 15th; cover lightly. Cut while in bloom before the seed hardens.

## PEARL MILLET

This is the largest variety of Millet grown. It looks very much like Sorghum, and we would take it to be of equal value. Under only moderate conditions it makes a large amount of forage per acre, and as only a small quantity of seed is necessary to sow an acre, it does not make an expensive forage. We grew an experiment patch last year, and we are pleased with the results. It may be sown broadcast, or drilled in and cultivated. The plants will grow from seven to twelve feet tall.

# SOJA BEANS

This is a plant which we believe deserves a very much larger place in American agriculture than it is receiving. On our own farm we have been growing these beans for a good many years, and to say that we like them is putting it very mildly. They serve several purposes. The plant is a legume, and if the soil is inoculated with the proper bacteria the nodules on the roots will rapidly fill the soil with nitrogen. The grain of some varieties is one of the richest known feeds, analysis of the Ito San having run as high as 38 per cent protein, and the average of many analyses being above 30 per cent. As a forage plant the proper varieties will make very large yields of hay, which, for nutrition, compares favorably with alfalfa itself. It is very valuable also to mix with corn fodder for filling silos, our neighbor, Humphrey Jones of Washington C. H., usually growing 100 acres for this purpose. As grain they are very greedily eaten by all kinds of live stock, although they should be ground if fed to anything excepting sheep. We have fed these beans to our young Dorset lambs, and by their use have been able to entirely dispense with oil meal, as well as practically all wheat bran, the beans, with a little ground barley and alfalfa hay, making so rich a feed that nothing else was required. They should be sown immediately after corn planting.

Very many of our customers ask us which we would prefer for enriching the soil, Soja Beans or Cow Peas. If the seed of each were about the same price, we do not know that we would make very much difference between them. Some varieties of Cow Peas will make more growth than dwarf varieties of the beans but in most cases the Soja Bean, especially in its larger varieties, has the advantage in this respect. Sometimes the bacteria which are native to the roots of Cow Peas seem to be more common in the soil than those of Soja Beans; that is, the Cow Pea more frequently inoculates itself than the Soja Bean does.

We think that all of our readers realize the fact that a legume of itself is not necessarily any better than any other crop unless the bacteria are present on its roots. In fact, a legume will impoverish the soil just like any other crop, unless the bacteria are present, so in this way the Cow Peas have a slight advantage over the Soja Beans. In another way however, the Soja Bean sometimes has the advantage; we plant from one-half bushel to one bushel Cow Peas per acre and about one-half that amount of Soja Beans, so that frequently an acre of Soja Beans may be planted more cheaply than an acre of Cow Peas. When this is true, and especially when you

can obtain one of the large growing varieties such as Medium Early Green, we prefer the Soja Bean to the Cow Pea. This year on Woodland Farm we put out about a dozen varieties of Soja Beans, among these being some small plots from seeds furnished us by the U. S. Government, and we confidently believe that as soon as we have enough seed from some of these new varieties to sell from, that we will be able to give our customers several new varieties that are very, very far superior to anything which is being grown at present. For instance, we had one variety which for silage, hay or fertilizing, would exceed anything else which we know of in America. This variety actually grew six feet tall. The season was adverse to its seed forming, and we obtained only a small amount of seed. We had other varieties that grew almost as large, and some of them were very heavily loaded. We would estimate that probably one or two varieties might have yielded at the rate of somewhere between thirty and fifty bushels per acre. Unfortunately, our plots were very small, and of most of these new varieties we have only about one bushel of seed. Next year we may be able to offer a little, but this year we cannot do so.

#### ITO SAN

This variety has been one of our standard beans for many years. It is an early variety, one that will mature beans even a long way north of us. It has plants of moderate size, not quite as good for fertilizing, silage or hay as the larger growing sorts, but an excellent variety for grain. It should yield about 20 bushels per acre, and one of its strong advantages is that the pods do not break and shatter the beans nearly as often as some of the other sorts.

#### MEDIUM EARLY YELLOW

This variety usually ripens a few days later than the Ito San. It usually has vines a trifle larger and sometimes will outyield the Ito San in grain.

#### MEDIUM EARLY GREEN

This variety has a good deal larger vines than the Ito San; it has large and heavy foliage; is a trifle later in maturing. We believe if it were possible to save all of the beans, that the Medium Early Green would be one of the heaviest yielding varieties which we have. Our experience with it has been that it must be handled very carefully or there will be a very large waste through the pods shattering. We are glad to recommend this bean either for foliage or grain, with this one caution, that it must be handled just right in order to prevent loss of grain.



### CANADIAN FIELD PEAS

These are very much recommended for fodder crop, especially for soiling. They may be fed either green or dry. As a fertilizer, also, they are very valuable, succeeding on soil that is too poor to grow clover. They are usually sown with oats — one bushel of each per acre. If sown alone, sow  $1\frac{1}{2}$  to 3 bushels per acre.

#### COW PEAS

These have a dual purpose, and wherever they are needed they are indispensable to the successful farming of the country. They will grow on soil so poor or impoverished that it is nearly impossible to grow any other farm crop. If one or two crops of them are grown and turned under for fertilizer, this same soil will then produce fair crops of every sort. In the South they are very extensively grown also for hay, being called the "clover" of the South. They are legumes, and gather nitrogen from the air to add to the soil. We strongly recommend growing a crop of these preparatory to attempting alfalfa, even on moderately fertile land. Sow in May or June, or after corn planting, from one-half to one bushel per acre.

# VETCHES

These plants should probably be grown more largely than they are. They serve as a valuable cover crop, afford abundant early spring pasture and may even be cut some for hay. When plowed under they greatly enrich the ground, and are largely used for this purpose. They are frequently sown in connection with oats or barley, rye or Mammoth Red clover, which serve as a support for the plants. The winter vetch will stay green all winter, and is one of the earliest crops to start in the spring.

## WINTER VETCH

It succeeds on nearly any soil, and in this state should not winter-kill. Sown in August it should cover the ground before winter. Sow 40 to 50 pounds per acre.

## SPRING VETCH

Usually sown with oats or barley. Sow about a bushel of vetch and like amount of grain per acre. Will make a large amount of the finest feed early in the summer.

## TRUE DWARF ESSEX RAPE

This is a plant which is coming into such prominence that description or recommendation is really unnecessary. It is of the cabbage family, and in feeding the same results may be expected as would be from feeding cabbage, but at a fraction of the cost for growing. Nearly all shepherds who exhibit at fairs expect to make a large part of their gains from this plant. It produces an enormous amount of forage per acre, which may be fed with absolute safety to sheep, hogs or cattle. At the Michigan Experiment Station 128 lambs pastured on 15 acres of rape showed a total gain of 2,890 pounds during 8 weeks, which is 3 pounds per lamb per week. Our seed is the True Dwarf Essex, and not the worthless annual. Sow 4 pounds per acre broadcast, or 2 to 3 pounds if in drills.

# WING'S SELECTED GRAINS

## SEED OATS, Swedish Select

Last year we sold a carload of this variety, the seed coming from Montana. It was the finest seed we ever saw outside of a grain exhibit, weighing close to fifty pounds to the measured bushel. Many of our customers secured very fine results from these oats. In some places where all other varieties failed, ours gave a fair yield. In other places, when compared with other oats, ours produced much the heaviest yield of any. Our Swedish Select Oats have stood up admirably, having large, coarse straw. They have rarely rusted, and the yield under good conditions has been excellent; while under adverse conditions, as before stated, they have frequently been the only oats in the country to yield anything at all. We have small stocks of these oats again this year.

It is uniformly agreed by all that Northern-grown oats will usually out-yield those grown farther south. For Ohio conditions, it has been found repeatedly that oats grown as far north as Minnesota will heavily out-yield the home-grown oats. If you can secure two or three bushels more per acre by using selected Northern-grown seed, then it will certainly pay to grow them, even at the price we are compelled to charge for this seed, while the probabilities are that you will secure five or ten bushels more per acre, or even more than that.

We will make an exception, however, of our customers in the South. We advise no one south of latitude 38° to use our Northern-grown oat seed.

## SEED OATS, AMERICAN WONDER

This variety also comes to us from Montana, and is very highly recommended to us. We have not grown it ourselves as yet, and have purchased small stocks of it, until we determine just how valuable it is. The seed which we offer is extremely large, plump seed, and will weigh over forty pounds to the measured bushel.

## SEED OATS, BIG FOUR

Our stocks of this come to us from Minnesota. They are of good weight, very fine color, and the seed is free from noxious weeds. The Big Four is one of about six varieties that have been tested by the Ohio Experiment Station for many years, and they show practically as high an average as any. Careful farmers throughout the country who have tried this variety have urged us to purchase it, as it has proven so profitable to them. We have done so, believing with them, that this is one of the finest varieties for this state and the states adjoining us.

### THE IMPROVED AMERICAN

This variety is one of five which have shown the highest yield with a ten-year test given by the Ohio Experiment Station. We cannot recommend this oat too highly. Our seed is absolutely pure. This oat is not only a heavy yielder, but has admirable stiffness of straw and produces highly under most conditions in this state.



*Champion Beardless Barley.*

## BARLEY

### CHAMPION BEARDESS

We are pioneers in growing beardless barley in Ohio. Somewhere we read that it was a valuable nurse crop for meadows, and also that it was invaluable feed for farm animals. We began growing it about ten years ago, and were so well pleased with it from the beginning that we have used it for a nurse crop on our farm to the exclusion of any other grain ever since our first experiment. It has short, very stiff straw and little foliage, and ripens only a little later than wheat, coming off the ground before the young meadow has begun to suffer at all. If sown as recommended it forms so little shade as to injure young meadows none whatever, and as it does not stool as much as oats and very rarely lodges, it practically never smothers the young meadow under it. If cut when in milk it makes a large amount of very valuable hay greedily eaten by all kinds of live stock. If cut for grain the straw may be fed with safety owing to its being beardless, and the grain is very rich, good feed. We have had splendid results from it when fed to sheep. If fed to hogs it must be either soaked or ground, and should be mixed with oil meal, tankage or other feed to form a balanced ration. Sheep like it so well that it must be fed with caution until they are accustomed to it, but after this time is reached it may be fed liberally, and will give as good results as any grain with which we are familiar. Our Champion variety is the heaviest yielding variety known, and at the same time forms a very excellent nurse crop. It should be sown at

the rate of about one and one-half bushels per acre for nurse crop, and for grain about two bushels per acre. Sow at oat seeding time.

We also have a stock of beardless spring barley which was sold to us by farmers who could not tell certainly what variety it was. It is pure beardless, and has been yielding heavily for the men from whom we purchased it, but it is impossible to tell certainly what variety it is. We should sow from one and one-half to two bushels per acre of it either for a nurse crop or for grain.

### WING'S BEARDED BARLEY

The popular malting barley — this grain is too well known to require description. Our stock was grown in the Northwest, and should be of the strongest vitality. We believe it cannot fail to give satisfaction.

### ODERBRUCKER BARLEY

This variety has been making a sensation in the Northwest, sometimes out-yielding all other varieties many bushels per acre. Our stocks come from reliable sources in the Northwest, and we believe, will please all who try them.

## RYE

A valuable crop for soiling, green fodder, straw or grain. It is largely used by farmers to seed in the fall, and pasture early in the spring. Our stock is Northern-grown, and will unquestionably give good results wherever sown.

# BUCKWHEAT

Our stocks are the best which we can obtain on market. We handle on a small commission, and our prices will be found to be on the market at all times.

## SEED WHEAT

The Ohio Experiment Station has conducted long time tests of every variety of wheat of any importance grown in the United States. Their recommendations on this account should be very useful. They state that for Ohio conditions the following varieties have given by far the heaviest yields in these long time tests: Gypsy, Nigger, Poole and Early Ripe, with the Fultz, Fulcaster and Mediterranean as being well adapted to some parts of Ohio, though not to all of it.

### FULTZ WHEAT

most widely known variety in this section of the country. It is a semi-hard, red grained variety. It is a heavy yielder, the stocks that we have purchased having produced about 30 to 40 bushels per acre. The straw is very stiff, and we can recommend this variety for strong ground. It is smooth, no beards.

### POOLE WHEAT

Poole Wheat is another very well known variety, one that succeeds under a great variety of conditions, and is well liked in all the adjoining states, as well as in Ohio. It is a smooth, semi-hard winter variety, a heavy yielder and a good milling variety.

### GYPSY WHEAT

Gypsy Wheat is our pet variety. Highly recommended by the Department of Agriculture, our stocks being grown from seed that came directly from our Experiment Station at Wooster, therefore absolutely pure. A heavy yielding bearded wheat, succeeding well under varying conditions, stands wet weather well, stiff straw, long heads, an excellent milling variety. We cannot recommend this wheat too highly.

In view of this statement we think Ohio farmers might as well confine themselves to these known and tried varieties instead of buying the new and untried varieties offered by seedmen, the experimental work belonging rightfully to experiment station and it being less expensive to the farmer to allow them to do this.

We will have next fall (1909) many, if not all, of these varieties of wheat to offer from the new crop, carefully selected and recleaned, and from the most vigorous stock obtainable.

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## LIST OF LIME MANUFACTURERS

Chewacla Lime Co., Calcis, Ala.  
B. E. Bowden, Calera, Ala.  
C. L. O'Neal, Calera, Ala.  
Shelby Lime Co., Calera, Ala.  
Birmingham Cement Co., Ensley, Ala.  
Standard Lime Co., Fort Payne, Ala.  
LeCarde Lime & Stone Co., Gadsden, Ala.  
Hurt & Co., Lime Rock, Ala.  
J. B. Adams, Long View, Ala.  
Long View Lime Works, Long View, Ala.  
Benton County White Lime Co., Bentonville, Ark.  
Alba Lime Co., Farmington, Ark.  
Ozark White Lime Co., Fayetteville, Ark.  
Crescent White Lime Works, Johnson, Ark.  
Fayette White Lime Co., Johnson, Ark.  
New England Lime, Brookfield, Conn.  
Anchor Lime Co., Canaan, Conn.  
The Stearns Lime Co., Danbury, Conn.

Cedar Hollow Lime Co., ft. Market St., Wilmington, Del.  
 Keystone Lime Co., ft. Market St., Wilmington, Del.  
 McCoy Lime Co., ft. Market St., Wilmington, Del.  
 Whiteland Lime Co., ft. Market St., Wilmington, Del.  
 Florida Lime Co., Ocala, Fla.  
 Ladd Lime Co., Cartersville, Ga.  
 Graysville Mining & Mfg. Co., Graysville, Ga.  
 Sciple Sons, 8 Central Ave., Atlanta, Ga.  
 Hall Co. Hydraulic Works, Gainesville, Ga.  
 M. M. Church, Graysville, Ga.  
 Southern Lime Co., Arragon, Ga.  
 Cable Lime Co., Delphi, Ind.  
 Eichel Lime & Stone Co., Eichel Blk., Evansville, Ind.  
 Wm. Moellerings Sons, 53 Murray St., Fort Wayne, Ind.  
 Greencastle Brick, Stone & Lime Co., Greencastle, Ind.  
 Caskalla Stone & Lime Co., Greencastle, Ind.  
 Western Lime Co., Huntington, Ind.  
 A. & C. Stone & Lime Co., Washington St. and Belt Ry., Indianapolis, Ind.  
 W. B. Keepert & Co., Logansport, Ind.  
 Mitchell Lime Co., Mitchell, Ind.  
 Reimon & Steeg Co., 901 Wabash St., Terre Haute, Ind.  
 Bertram Lime Co., Bertram, Iowa.  
 Des Moines Fuel & Lime Co., 511 Mulberry St., Des Moines, Iowa.  
 Mason City Lime & Cement Co., Mason City, Iowa.  
 Iowa Lime Co., Viola, Iowa.  
 Artesian Stone & Lime Works, Grand and Campbell Ave., Chicago, Ill.  
 Southern Illinois Penitentiary, Menard, Ill.  
 Southwestern Contracting & Engineering Co., East St. Louis, Ill.  
 The Curry Fertilizer Co., Louisville, Ky.  
 C. C. Cook, Bowling Green, Ky.  
 Limestone Mining & Mfg. Co., Ashland, Ky.  
 Dickinson Bros., Glasgow, Ky.  
 P. A. Blackwell & Co., Henderson, Ky.  
 Union Cement & Lime Co., 421 W. Main St., Louisville, Ky.  
 Utica Lime Co., 421 W. Main St., Louisville, Ky.  
 Kruger & Sons, Mt. Vernon, Ky.  
 Louisiana Lime Co., New Orleans, La.  
 Fiske Homes & Co., 164 Devonshire St., Boston, Mass.  
 Wallace Stone & Lime Co., Bay Port, Mass.  
 Lee Lime Co., Lee, Mass.  
 Alpena Lime Works, Alpena, Mich.  
 W. F. Heames Co., 71 Woodbridge St., Detroit, Mich.  
 Northwestern Lime Co., 71 Lower Levee St., St. Paul, Minn.  
 Shakopee Cement & Lime Mfg. Co., Shakopee, Minn.  
 H. J. Willis, 2d and Main Sts., Winona, Minn.  
 Crystal Lime & Carbonate Co., Ellsberry, Missouri.  
 Superior Crushed Limestone Co., Carthage, Missouri.  
 Ash Grove Lime & Portland Cement Co., Ash Grove, Mo.  
 Casper Stolle Quarry & Contracting Co., St. Louis, Mo.  
 Crystal Carbonate Lime Co., Elsberry, Mo.  
 Western Crushed Limestone Co., Carthage, Mo.  
 Rockland-Rockport Lime Co., Camden, Maine.  
 A. D. Bird & Co., 575 Main St., Rockland, Maine.  
 Maryland Lime & Cement Co., Carroll Bldg., Baltimore, Md.  
 Grove Lime Co., Frederick, Md.  
 Superior Lime Co., Texas, Md.  
 Baltimore Pulverizing Co., Baltimore, Md.  
 Tabler Lime & Stone Co., Frederick, Md.  
 Camden Lime Co., 12th and Federal Sts., Camden, N. J.  
 Windsor Lime Co., Hamburg, N. J.  
 New Jersey Lime Co., McAlfee Valley, N. J.  
 Windsor Lime Co., Center St. Wharf, Newark, N. J.  
 Barclay S. Smith, Camden, N. J.  
 Russell Mfg. Co., Jersey City, N. J.  
 Rochester Lime Co., 209 W. Main St., Rochester, N. Y.  
 C. H. Coons, Germantown, N. Y.

THE J. E. WING & BROS. SEED CO., MECHANICSBURG, OHIO

Catlin & Miller, Owego, N. Y.  
John Heimlich, Le Roy, N. Y.  
Genesee Lime Co., Honeoye Falls, N. Y.  
New York Lime Co., Carthage, N. Y.  
Beaver Creek Lime Co., Kinston, N. C.  
Kelly Island Lime & Transport Co., Rockefeller Bldg., Cleveland, Ohio.  
J. H. Conkling, Gilbert Ave. and Court St., Cincinnati, Ohio.  
Ohio & Western Lime Co., Sugar Ridge, Ohio.  
The France Lime Co., Bloomville, Ohio.  
Ohio & Western Lime Co., Fostoria, Ohio.  
Casparis Stone Co., Columbus, Ohio.  
Bellefonte Lime Co., Bellefonte, Pa.  
Easton Lime Co., Easton, Pa.  
Knickerbocker Lime Co., Frazer, Pa.  
Knickerbocker Lime Co., 366 N. 44th St., Philadelphia, Pa.  
Thos. Robinson & Co., 1404 Real Est. Trust Bldg., Philadelphia, Pa.  
A. C. Morris Lime & Limestone Bld., Empire Bldg., Pittsburg, Pa.  
C. & W. H. Carson, Plymouth Meeting, Pa.  
Todd & Son, Port Kennedy, Pa.  
Pearson Plaster & Supply Co., 121 Green Ridge St., Scranton, Pa.  
York Valley Lime Co., Howard & Mason Aves., York, Pa.  
M. E. Reeder, Muncy, Pa.  
Carroll & Co., Gaffney, S. C.  
W. H. Richardson & Co., Gaffney, S. C.  
Lime Stone Springs & Lime Co., Spartanburg, S. C.  
Gager Lime & Mfg. Co., Chamberlain Bldg., Chattanooga, Tenn.  
Tenn. Marble Lime Co., Houston Bldg., Knoxville, Tenn.  
Wright Lime & Cement Co., 33 S. Third St., Memphis, Tenn.  
Tennessee Cement & Lime Co., 243 1/2 4th Ave., N., Nashville, Tenn.  
Gager Lime & Mfg. Co., Sherwood, Tenn.  
Acme Cement & Plaster Co., Acme, Tex.  
Austin White Lime Co., Acme, Tex.  
Alamo Cement Co., 207 Main Ave., El Paso, Tex.  
J. C. Dielman, 305 E. Commerce St., El Paso, Tex.  
Ft. Worth Lime Works, Pine & Kennedy St., Ft. Worth, Tex.  
Wm. Walsh & Co., Round Rock, Tex.  
Brandon Lime & Marble Co., Leicester Junction, Vt.  
H. C. Palmer, New Haven, Vt.  
Rockbridge Lime Co., Lexington, Va.  
E. Dillon's Sons, Buchanan, Va.  
Riverton Lime Co., Riverton, Va.  
A. S. Lees & Sons Co., 108 S. 13th St., Richmond, Va.  
Fellsworth Lime Works, Staunton, Va.  
M. J. Grove Lime Co., Stephens City, Va.  
Eureka Lime Co., Vicar Switch, Va.  
Powhattan Lime Co., Strasburg, Va.  
Arthur F. Garber, Marble Valley, Va.  
Rockbridge Lime and Stone Co., Lexington, Va.  
T. C. Andrews & Co., Norfolk, Va.  
Milwaukee Falls Lime Co., Humboldt Ave., Milwaukee, Wis.  
Sheboygan Lime Works, Sheboygan, Wis.  
Standard Lime & Stone Co., Buckhorn, W. Va.  
Greenbrier Portland Cement Co., Fort Spring, W. Va.  
Washington Bldg. Lime Co., Bakerton, W. Va.  
Hezekiah McDowell, Martinsburg, W. Va.  
Standard Lime & Stone Co., Martinsburg, W. Va.  
Virginia Lime & Cement Co., Parsons, W. Va.  
Standard Lime & Stone Co., Kearneysville, W. Va.  
Harpers Ferry Lime Co., Millville, W. Va.



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